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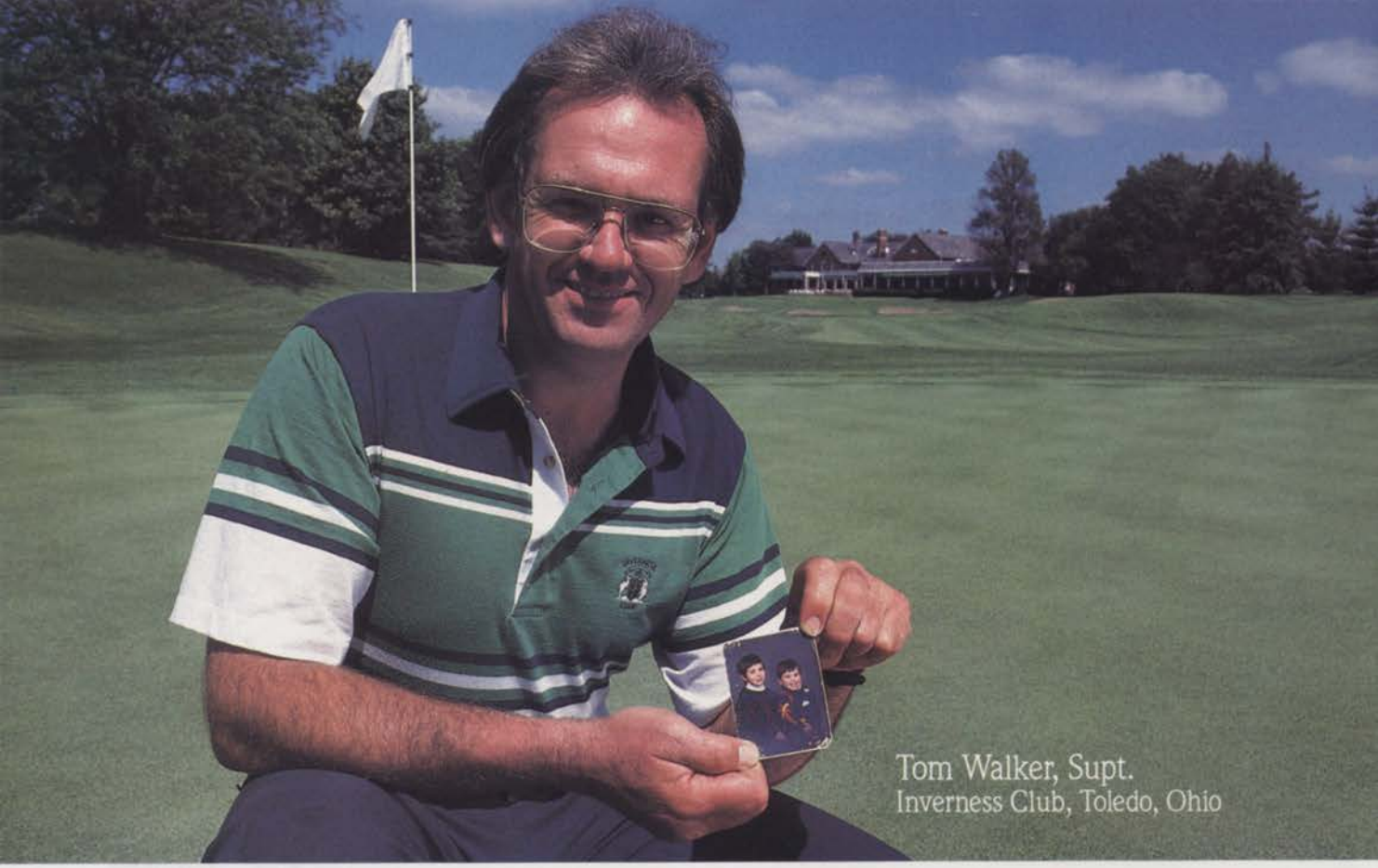

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AS I SEE IT...

The name of the game is the name

Have you looked at your name lately?

Benjamin Kubelsky once looked at his and decided it'd never make the grade in the competitive radio business. Executives at Allegheny Airlines grew distraught with a bottom line that was red. In each case, a new name helped change the public's perception and thus more easily gain acceptance of the product. Jack Benny became one of the all-time most popular radio and television performers. And USAir's bottom line turned very black indeed shortly after its name change.

"The name of the game is the name—and don't forget it," relates Harry Wayne McMahan, an independent commercial consultant in Escondido, Calif. "Here is where all advertising starts."

In the new, more sophisticated landscape market, "Joe's Mowing" may not cut it any more. We at this magazine, obviously, favor the term "Landscape Management" over less sophisticated names.

One flip through the Associated Landscape Contractors of America membership directory proves our point. Most of those upscale businesses employ the word "landscape" in some manner: Davis Landscape Contractors, A.J. Chiancone Landscape & Nursery, Thornton Landscape and Ground Control Landscaping, for instance.

(Just because you're in the private sector doesn't mean that you've got to settle for a title with less panache, either. Tom Sprague, who takes care of the 20 acres at Edgell Communications' Cleveland headquarters, likes the ring of "landscape supervisor.")

There is a flip side to a name change, however. If you've been around a long time and your name has become synonymous with quality—no matter what name you're using now—there's no sense changing it. And remember that if you're considering upgrading your name to attract new business, it might not hurt upgrading your service at the same time.

As we embark on the final decade of the 20th century, then, you might ask yourself: "Is the name of my business really in step with the times?"

Jerry Roche

Jerry Roche, executive editor

LM

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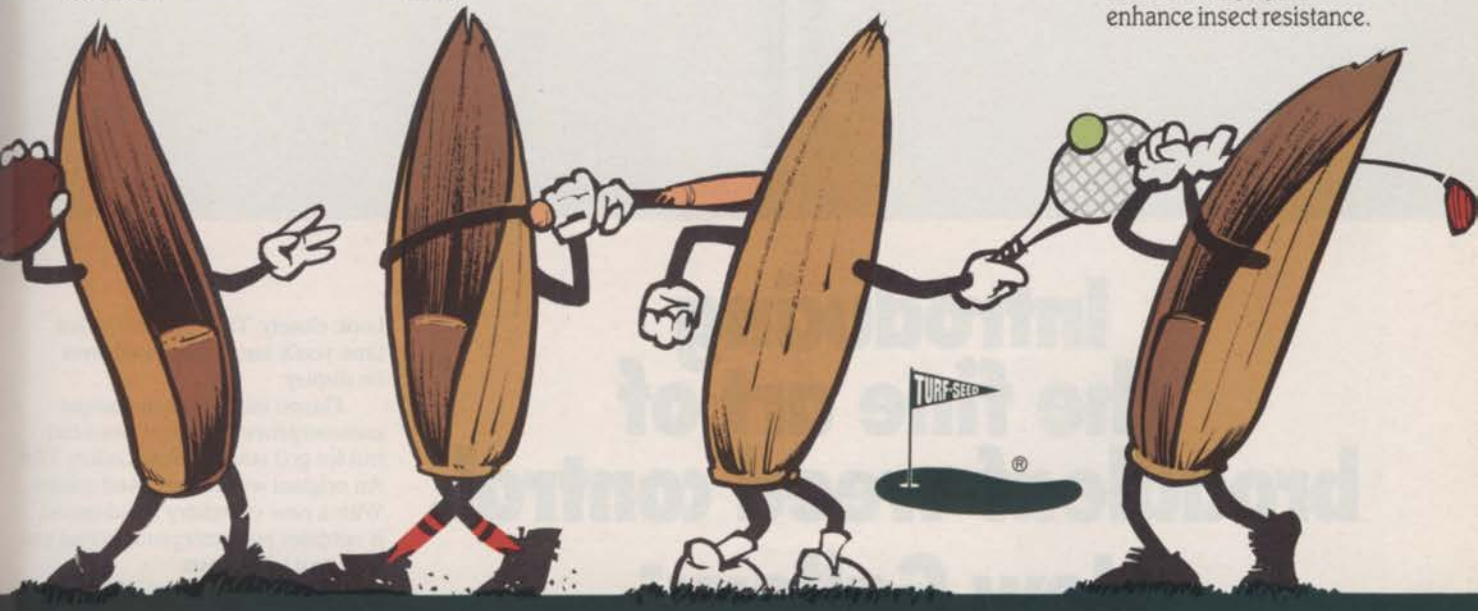

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GREEN INDUSTRY NEWS

FEBRUARY 1990, VOLUME 29, NUMBER 2

LANDSCAPE MANAGEMENT

LANDSCAPING

Leaving grass clippings saves vanishing landfills

MOLINE, Ill. — More than 25 states have passed or are studying legislation to change the way people discard their grass clippings and leaves, say the people at John Deere & Company. And landscape maintenance contractors can play a key role in helping keep the 16,400 landfills in the U.S. open.

"Grass clippings can be distributed across the lawn most of the time," says Bob Tracinski of Deere. He recommends that lawns be mowed frequently enough to remove only the top one-third of the grass blade.

Tracinski says that short clippings deteriorate quickly and return nutrients to the soil. He and other experts estimate that a season's worth of grass clippings is equal to one application of most commercially-available fertilizers.

Landscapers need not pick up clippings, as is pictured here. It's less trouble and just as healthy to leave them—as long as too much isn't leaf isn't cut at a time.

Tracinski also claims that homeowners need to be educated on the relationship between clippings and thatch. "Thatch is caused by feeding a lawn too often and encouraging the roots to stay near the surface to get nutrients easily," he astutely notes. "Watering too lightly forces the roots to stay near the surface to reach the moisture."

Cities and towns have begun to consider clipping legislation because landfills are filling up rapidly. It's estimated that half of the country's landfills will be closed by the year 2000. And new landfills are being created slowly because of strict licensing procedures that take a long time to complete.

According to studies, landscape waste accounts for nearly 20 percent of the trash in landfills.

"I've been recycling lawn debris at my home for about 10 years," Tracinski says. "In fall, I dump the chopped leaves under a row of pine trees at the back of my yard and spread them out. They blend with the fallen pine needles and produce a forest floor effect. The rest of the year, I either distribute the grass clippings or compost them."

Deere has free booklets on lawn care and composting available by writing: Recycling Booklets, 1400 Third Avenue, Moline, IL 51265. □

INSURANCE

GCSAA develops a low-cost plan for underground tanks

LAWRENCE, Kan.—Increasing concern over stifling insurance premiums has led the Golf Course Superintendents Association (GCSAA) to develop a low-cost plan for underground storage tank liability insurance.

Environmental Protection Agency (EPA) standards that will be in effect this coming October will require businesses that dispense petroleum products to take increased financial responsibility for potential leakage or spill incidents and long-term pollution. That responsibility adds up to about $1.5 to $2 million per tank, or premiums of $25,000 to $40,000 per tank—more than most golf courses can afford.

"We're going to be offering an insurance program that will allow courses to insure their underground storage tanks at extraordinarily reasonable rates," says Pat Jones, GCSAA director of communications.

"We're forming a risk-retention group among GCSAA members, allowing them to work with their golf course to determine if their club needs protection."

continued on page 11

POSTING & NOTIFICATION REGULATIONS

STATE	WHO?	SIZE?	WHERE?	WHEN?	CONTRACTS?	TO WHOM?
Connecticut	C, LC, GC, TS, HO	**	spec. intervals	time of app	no	central registry
Florida	**	**			no	central registry
Illinois	C, LC, TS, GC	4×5 8½×11	spec. intervals, conspicuous pts. on golf courses	time of app	no	customers, neighbors, upon request
Massachusetts	C, LC	4×5	conspicuous pts.	prior to app, time of app	no	customers, upon request
Maine	C, LC, TS	4×5	spec. intervals, conspicuous pts. on golf courses	prior to app or time of app	no	upon request central registry
Minnesota					yes	
New Hampshire	C, LC, GC	81/2	conspicuous pts.	prior to app	no	customers, upon request
New Jersey	C, LC, TS, GC, PC		conspicuous pts.	prior to app, upon request	no	
New York	C, LC, TS	51/2×8 81/2×11 12×12	75 feet apart 100 feet apart 150 feet apart	time of app	yes	
Ohio	C, LC	4×5	conspicuous pts.	tim eof app	no	customers, neighbors, upon request
Rhode Island	C, LC	4×5	conspicuous pts.	prior to app, tim eof app	no	customers, neighbors, upon request

C=commercial applicators
LC=lawn care operators
TS=tree & shrub companies
GC=golf courses
HO=homeowners
PC=pest control operators

**under development

Source: Pesticide Public Policy Foundation

PESTICIDES

New York State legislation is defeated

ALBANY, N.Y. — A state appeals court has struck down complicated regulations being battled by New York lawn care operators.

The five State Supreme Court appellate justices ruled that the New York's Department of Environmental Conservation should have conducted an environmental impact study before implementing the rules.

Laws passed in 1983 and 1987 that require posting, contracts and pre-notification remain intact.

The rejected regulations consisted of 40 pages of detailed rules. "It will be a much-simplified notification package," says Elizabeth Seme of the New York State Green Council.

"It's a relief that these regulations won't go through because there's no way that we could comply with them," says Laurie R. Broccolo, manager of lawn and tree care at Ted Collins Associates in Victor, N.Y.

"We couldn't even understand some of the regulations" because they were poorly written, she adds.

"Most people couldn't understand them," Seme agrees. "You had to go back and read them each time" a pesticide-related business decision had to be made.

Some of the rejected requirements included the posting of signs every 75 feet around a property, and tight restrictions on how companies could reschedule applications after rain delays and similar interruptions.

The state still retains the option of appealing the ruling.

(For other regulations affecting LCOs, as of January, 1990, see chart above.)

—Jim Guyette□

TANKS *from page 8*

Jones estimates the group coverage will cost less than 20 per cent of what they might pay for a commercial policy, with no deductible.

"We have to offer it to our members because they can't find it anywhere else," says Jones. "It's a reasonable premium rate compared to being thrown in with petroleum companies, convenience stores and gas stations." □

SEED

Turfseed industry seeking commitments

PORTLAND, Ore.— The seed industry is readying its defense against anti-field burning legislation. A final showdown on the issue is expected late this year.

Dr. Bill Meyer, director of research for Turfseed and Tee-2-Green and president of the Oregon Seed Trade Association, recently updated members on the issue, outlining how the association will work for fair legislation. He also stressed the need for moral and financial support from seed producers.

"Our actions on this issue," predicts Meyer, "will determine the outcome of issues related to chemical use, dust problems and groundwater concerns, to name just a few."

A Political Action Committee (PAC) has been formed to accept donations to finance lobbying efforts. In a written message to seed company members, the association suggests donations of between $5000 and $7500 to finance the pro-field burning campaign.

continued on page 12

SEED *from page 11*

Dr. William Meyer: "We cannot bury our heads and hope somebody else will take care of our industry."

One initiative would level an immediate ban on burning. Another calls for a virtual ban on burning by 1995, at which time burnable acreage would be reduced to 50,000 acres. Exceptions would exist to go beyond the limitations of propane flaming in cases of using appropriate emission control technologies.

According to Meyer, such propaning standards are unreachable with current technology.

"There is no question that we must find alternatives to open burning," insists Meyer. "However, we must have enough time to test alternatives to field burning."

Meyer says the industry proposal, which would allow for 160,000 acres of field burning for eight years, "must be presented to the public and decision makers as the most appropriate public policy choice." □

RESEARCH

Fresa clover is alternative to mowing in Southwest locales

LAS CRUCES, N.M. — Southwesterners have an alternative to mowing: fresa strawberry clover, a groundcover developed in the New Mexico State University Agricultural Experiment Station breeding program.

According to Dr. Arden A. Baltensperger, a person could get away with mowing fresa as little as twice a year. More frequent mowing, however, will keep the clover more uniform and looking good.

The NMSU crop scientist not only developed fresa, which was released in 1983, but also has it planted in his own yard.

Fresa can be planted by itself in low traffic areas, or mixed in with other grasses. It is not for everyone, he cautions, as the clover will not take wear and tear from children as well as many grass lawns will.

An attractive ground cover, fresa stays green about 10 months of the year. It has pink flowers and resembles strawberries, Baltensperger says, although there have been problems with bees on the fresa at his home.

In field tests, fresa compared favorably to other clovers for winter color and general appearance. Importantly, it had a lower growing height and plant height than other strawberry clovers. In making selections for fresa during breeding, low plant height had been a primary consideration, Baltensperger says. Fresa needs about as much or more water as bermudagrass, but doesn't need any nitrogen fertilization, Baltensperger adds.

He points out that fresa strawberry clover is a legume, which means it can fix nitrogen from the soil. To enhance this nitrogen fixing capability, some phosphorus might need to be applied to fresa. The nitrogen fixing properties of fresa make it valuable in a mix, because it can provide nitrogen to other grasses, the scientist says.

In field tests, researchers found the general appearance of dormant bluegrass and bermudagrass was improved by having fresa in the stand.

Although fresa has not been tested outside of the Southwest, Baltensperger notes some interest in the clover in France and in the Netherlands. □

Dick Holschu (left) and Bill Culpepper: DowElanco to be a market leader in providing industry with new technology.

INDUSTRY

Resources spur DowElanco

CLEVELAND — Focusing on the customer and the health of the green industry is the emerging philosophy of DowElanco, Inc.

Representatives of the chemical giant, forged by the recent merger of Dow Chemical and Eli Lilly, say the company has learned from corporate America's inability to match foreign competition in the 1980s.

"The lesson is not lost on DowElanco," says commercial director Bill Culpepper. "We need to be more focused on the customer. We need to know what they need and then do it."

Culpepper and general manager Dick Holschu tell LANDSCAPE MANAGEMENT that DowElanco will "do it" through educational programs and by creating four divisions within the company. They are: turf and ornamentals; industrial insecticide; vegetation management; and marketing of technical chemistry. Each division will have a sales and marketing staff.

"The combining of our technology is going to allow us to be a leader in providing new technology to the market," adds Holschu. "We know that bigger is not necessarily better, but we now have the critical mass of sales dollars and dollars to reinvest into the discovery of new technology. Our goal is to use this to become a full-blown partner in the markets that we serve." □

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INSECTS

Southern pests moving north?

VALLEY FORGE, Pa. — Some pests traditionally considered a problem only in the South may become headaches for northern landscape managers too, says Dr. Pat Cobb, an Auburn University entomologist.

Spittlebugs, fire ants, mole crickets and green June beetles may pose a future threat to cool-season turf, says Cobb—but not right away.

"Some insect pests are on the move, and why this is we're not sure. One factor is that we lost the residual insecticides out of the soil," Cobb told landscapers at the Eastern Pennsylvania Turfgrass Association's annual meeting. "Another reason is that all across the United States, especially in the South, we're growing better grass, and insect pests are attracted to the greenest, most lush turf."

Dr. Pat Cobb

Mole crickets, the most damaging southern insect, are beginning to make an impact in the north. Entomologists in southern Illinois and New Jersey have reported identifying more northern mole crickets in the past two years than all years previous, Cobb says.

They're difficult to control because they can go as deep as eight feet, move quickly (perhaps several feet a night) and they fly twice a year.

"I don't know whether you'll have a mole cricket problem or not," says Cobb, "but there's no question that mole crickets are on the move. And when you have them you'll know it."

The green June beetle is "easy to kill but difficult to control" because the beetle flies for a longer period of time, extending the period it lays eggs. The lowest insecticide rates will wipe out the grubs, adds Cobb.

The two-line spittlebug used to be found only along the coast from Maine to Florida, says Cobb, but it too has begun moving inland. It has been found in the northern part of states bordering the Gulf of Mexico and Oklahoma. It is most dangerous in its immature stage and needs a lot of moisture to survive.

"I can't say what the extent of the problem will be," says Cobb, "but the insect is distributed in the eastern part of the country. So the potential is there for it to spread, as we've seen it spread in the South."

The best way to control the spittlebug is to dethatch, thereby disrupting the environment for its development, adds Cobb.

Fire ants have been reported in southern Tennessee. In the South, "they're a problem, but not something we haven't learned to manage," she says.

"Fire ants survive real well in interiorscapes. They survive well in greenhouses and other protected container stock. So that's why it's important for you to be aware that we have had some reports from this area of fire ants brought in by nursery stock," says Cobb. □

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LETTERS

On biologicals...

To the editor:

Your magazine is well-written and becoming more informative each month. I'm enjoying the reading during this frigid winter.

I might suggest some research and articles (unless you've written some already?) on the Japanese beetle grub problem and control with milky spore. I am having difficulty in getting accurate and substantial information about the biological control.

The New York area, especially Long Island, was hit fairly severely during the summer of 1989. Many of the materials like Dylox, Proxol and Turcam work, but residual action is not adequate to eliminate service calls. Triumph is not legal in New York, but appears to be the best material out thus far, and I'm sure—as you know—Oftanol has a poor track record here.

Philip A. Raices
Lawn Gro Ltd.
Hempstead, N.Y.

(Our November and December, 1989 issues contained a two-part series on biocontrols for the green industry. In addition, our annual Insect Control Guide, to appear in the April and May, 1990 issues, will address the problems you cite.—ED.)

Old news?

To the editor:

I am writing in response to the "Jobtalk" section of the December issue.

First, the information contained on page 38 is over three years old and is no longer in any way accurate to the methods and procedures currently used by the industry. Nor does it represent my current position as to the use of tree growth regulators.

You must immediately notify your readers that the chemical company manufacturing the product should be contacted before using any growth regulators. Representatives of the chemical companies can provide current recommendations for the use of their products.

Secondly, I was not contacted and did not give permission for use of my name or my company's name in the article. The same situation exits for the current management of Union Electric Company.

Thirdly, before future publications, I recommend that your magazine: check the age and accuracy of the information to be printed and obtain written permission from companies and individuals you wish to quote.

Paul A. Johnston
Environmental Consulting
Southampton, Pa.
John Czaicki
Union Electric
St. Louis, Mo.

(The piece was submitted by a writer for a public relations agency and was one year old—our time limit—when it was typeset for publication. The time lapse from its inception until the time it was submitted to us was undoubtedly also overlong. LM regrets these circumstances and will take steps to improve its communications with public relations agencies.—ED.)

Differing opinion

To the editor:

This is just so you will know that someone is reading your editorials ("As I See It," December, 1989). Don't be terribly offended, but I just think your position is a little out of sync with reality.

Clearly, I empathize with your travel issues. I probably travel 5% of what you do, and don't especially like it a lot. However, it's your job, not mine.

My point is that the consolidation of trade shows

continued on page 15

LETTERS *from page 14*

wasn't nor should it be done to serve the birthday schedules of the press. Suppliers, the second half of your editorial, will clearly benefit from the consolidation. However, the jury is still out on whether the customers (the reason there even is a trade show) will see an enhanced opportunity. Probably...but I think it's a 50-50 bet right now.

Several years ago, I encouraged you to use your space to take a position. I didn't mean to air your personal grievances.

Jerome R. Faulring
HydroLawn
Gaithersburg, Md.

(Thanks for your comments, Jerry. The position, however, is clearly evident in the last sentences: "It's a win-win situation. And it's about time." We indeed hope the conference and show in November comes off without a hitch, and that both suppliers and landscape managers benefit.—ED.)

EVENTS

FEBRUARY

19-26: Golf Course Superintendents' Association of America conference and trade show, Orange County Convention/Civic Center, Orlando, Fla. Contact: GCSAA, 1617 St. Andrews Dr., Lawrence, KS 66046; (913) 841-2240.

15-16: National Institute on Park and Grounds Management athletic turf management seminar, Jacksonville, Fla. Contact: P.O. Box 1936, Appleton, WI 54913; (414) 733-2301.

16-18: Florida Nursery Growers' Association spring trade show, Jacksonville, Fla. Contact: FNGA, 5401 Kirkman Rd., Suite 650, Orlando, FL 32819; (407) 345-8137.

19-20: International Society of Arboriculture Pennsylvania-Delaware Chapter shade tree symposium, Hershey, Pa. Contact: Sara Pilling, 29 Garrett Ave., Rosemont, PA 19010; (215) 525-7331.

22-24: Midwest Regional Turf Conference and Trade Show, Indianapolis, Ind. Contact: Clark Throssell or Jeff Lefton, Dept. of Agronomy, Purdue University, W. Lafayette, IN 47097; (317) 494-8039.

23: Geogrid Soil Reinforcement Symposium, Radisson University Hotel, Minneapolis, Minn. Contact: Sheila Bailey, Conwed Corp., (612) 631-5727.

23-24: Professional Landscape Conference and Trade Show, Atlanta, Ga. Contact: Bob Ragsdale, extension conference specialist, (912) 386-3416; or Sherry Phillips, admin.sec., (404) 492-4667.

24: Long Island Tree Conference, State University of New York, Farmingdale. Contact: Long Island Arboricultural Association, Box 69, Holtsville, NY 11742; (516) 698-3366.

24-25: Tampa Bay Horticultural Trade Show, Florida State Fairgrounds, Tampa, Fla. Contact: Bette S. Walker, 6804-C Gunn Hwy., Tampa, FL 33625; (813) 920-4393.

MARCH

6: Southeast Sports Turf Institute, Citrus Bowl, Orlando, Fla. Contact: Sports Turf Managers Association, 400 North Mountain Ave., Suite 301, Upland, CA 91786; (714) 981-9199.

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EXP-0-101 (I)

GOLF

New Florida course for 'working public'

DeBARY, Fla.—The DeBary Plantation golf facility opens this April in DeBary, Fla., to provide much-needed relief for the area's dearth of golf courses.

An 18-hole layout with up to 1,440 home sites outlining the course, it will be public.

"The DeBary ownership wants to provide a club for the working public," says superintendent Mike Kenovich (see "Florida's Best" story, this issue). "Being centrally located, this is going to be a course the people will flock to."

Course construction began on January 16, 1989. Planting began in late June and was completed by the first of August. The course was sprigged with hybrid bermudagrass: 328 for the tees, Tifway dwarf for the greens.

"We wanted a fine-bladed grass we could work with in case we hold tournaments," explains Kenovich. "The roughs were planted with 419 bermuda, which is a little denser, coarser," he adds.

The DeBary Plantation is composed of three types of sandy soil: red fine, gray organic and sugar sand. "We put the gray organic where we thought it would be dry, and the sugar sand in wetter areas. Red fine is used in choice areas, such as greens, tees fairways and other heavy play areas."

In some areas, soil pH was a low 4.7. Approximately two tons per acre of dolomite lime was used to raise the pH to the 6.5 range.

Fairway topdressing is a 90-10 mix of Department of Transportation sand and Florida peat. The greens mix is an 80-20 combination. At work below the course are nearly three miles of irrigation pipe, 11 miles of wiring and five miles of insulator pipe. □

The course was originally slated for a February debut, but Kenovich wanted extra time to complete road paving and other final preparations. □

PESTICIDES

Cancellation of pesticides concerns horticulturalists

WASHINGTON, D.C. — Almost one-half of all current pesticide registrations are being cancelled by the Environmental Protection Agency because the registrants did not pay the annual $425 maintenance fee in 1989. This announcement was made at a symposium on minor crop use pesticide registration that was attended by top EPA, USDA and other government officials, along with pesticide manufacturers.

Out of about 45,000 pesticide registrations for all uses, almost 20,000 are being lost, the EPA said. (Most of the products, however, had no recent commercial production.)

The government and pesticide industry speakers at the symposium, co-sponsored by the American Association of Nurserymen, observed that this loss was just the beginning. Chemical companies are most likely to drop even more registrations, especially those with limited commercial use, as testing costs and administrative burdens of maintaining multiple registrations increase.

The AAN has testified before Congress urging a modification of pesticide re-registration requirements to take into account low-volume users such as the environmental horticulture industry. In addition, AAN has met with USDA officials to stess the industry's concerns about "minor use" pesticides. □

SHORT CUTS

NOTHING TRIVIAL... Can-Am Golf Enterprises and Hurdzan Design Group combined with "Trivial Pursuit" co-developer Chris Haney to complete Devil's Pulpit Golf Course north of Ontario, Canada. The course is already being touted as one of the top five in that country, and a sister course, Devils Links, will start construction this spring. Devil's Pulpit memberships were sold out before ground was even broken.

THE CONCRETE JUNGLE... Researchers have found a new way to eliminate weeds that force their way through cracks in urban pavements like streets and sidewalks. It's a plastic rope containing herbicides which has been jointly developed by Batelle Pacific Northwest Laboratories and R.M. Engineered Products. It is hoped to last for up to 20 years. According to an article in *Business Week*, a large-scale test will be made on taxiways and runways at Chicago O'Hare International Airport.

ON LINE... The Ohio State University Agricultural Technical Institute in Wooster, Ohio, is the only college in the United States to have a complete "Slice" computer system. "There's nothing out there finer than 'Slice,' and we have as much technology at OSU/ATI as many of the major landscape companies in the country," says associate horticulture professor **Kent Hammond**. The system was donated by Thornton Computer Management Systems of Maineville, Ohio. The college joins more than 200 landscape companies in the U.S. and Canada to have installed the system.

THERE'S NO BUSINESS LIKE... The Garden Council's first national television commercial will appear this month. It features **Bob Thompson**, host of PBS-TV's "Victory Garden." Thompson reminds viewers that retail nurseries, garden centers and landscape professionals are the best sources of information for landscaping and garden activities.

RATING THE ROADSIDES...LANDSCAPE MANAGEMENT says congratulations to **Loyd Corrado**, **Jim Duke** and **Wayne Muri**, winners of National Roadside Vegetation Management Association awards. Corrado, maintenance supervisor for Kansas City, Mo., won the municipality/city agency category. Duke, resource manager for Pitkin County Land Management, Aspen, Colo., won the county highway/road agency category. Muri, chief engineer for the Missouri Highway and Transportation Dept., won the state/federal agency category.

LAWN CARE

Spring is time to start looking out for lyme disease

ATLANTIC CITY, N.J. — Officials at Lawn Doctor headquarters in Matawan, N.J. are expecting "the problem of lyme disease to increase in the 1990s," according to information disseminated at the company's annual franchisee seminar here.

"The peak period of lyme disease incidence (May-June-July) coordinates with people's outdoor activity," notes Bill Davis of Lawn Doctor. "And northeastern states have shown a high concentration of the disease." Davis says that New York Medical College found one county with 1200 confirmed cases of lyme disease. Research showed that 65 percent of the cases had picked up the disease from infected ticks in their own lawn.

Symptoms of the disease come in three "phases:"

Phase I: bulls-eye rash

Phase II: chills and fever, headaches, fatigue, pain and swelling in joints

Phase III: irreversible arthritis, cardiac damage, facial paralysis, nerve damage.

Here are hints that Davis gave to franchisees on minimizing the disease:

- instruct homeowners to keep lawns mowed and raked, underbrush clean;
- tell them to locate bird feeders away from the house;
- have them inspect children and pets for ticks;
- stay away from wooded areas;
- when making chemical applications, keep pant legs tucked in boots or socks;
- spray lawns with Dursban 50 WSP or Dursban granules for flea and tick control. □

LAWN CARE

State groups will organize with help from the PLCAA

INDIANAPOLIS — Lawn care operators representing 19 states are taking steps to form statewide associations.

Detailed organizational meetings are set to begin this month, according to Robert E. Andrews of the Indiana State Lawn Care Association. He is spearheading the efforts, which are sponsored by Monsanto and the Professional Lawn Care Association of America.

Preliminary seminars were planned here in December, and Andrews was pleased with the anticipated turnout. "If we could have had six or seven states we'd be pleased, but we have 19," he said.

Interested representatives hail from Tennessee, Oklahoma, Illinois, Pennsylvania, Ohio, Michigan, Wisconsin, Minnesota, Texas, Montana, New Jersey, Colorado, Nebraska, Massachusetts, Connecticut, North Dakota, Florida, Iowa and Idaho. □

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EXP-0-102 (I)

SEED

Amigo dwarf tall fescue gets PVP

GOLDEN VALLEY, Minn. — Amigo dwarf tall fescue has been granted Plant Variety Protection (PVP) by the U.S. Department of Agriculture.

Northrup King's Medalist Turf Division entered the new grass plant (code 5HF) in the National Tall Fescue Turfgrass Trials. It, according to Northrup King, was rated in the top 10 percentile.

Characteristics said to be unique to Amigo are a fine-textured, low-growing plant and excellent color.

Buyers can expect to see Amigo available in the fall of 1990. Northrup King says it expects to have an adequate supply for the sod grower and lawn care industries. □

For more information, contact Northrup King, 7500 Olson Memorial Highway, Golden Valley, MN 55427; (800 328-2425). □

The Toro Company is the founding sponsor of the Shrine Gardens at the PGA/World Golf Hall of Fame. The well-manicured gardens are dedicated to golf course superintendents.

GOLF

Garden honors golf supers

PINEHURST, N.C. — Shrine Gardens has been established here to recognize the golf course superintendent's service and contributions to the game of golf.

The beautifully landscaped gardens, located near the entrance to the Professional Golfers' Association World Golf Hall of Fame shrine building, includes a plaque that dedicates the gardens to golf course superintendents around the world. The project was publicly dedicated on Nov. 2, 1989.

The Shrine Gardens project is an effort to provide golf course superintendents with much deserved recognition, according to Mike Hoffman, director of marketing of commercial products at the Toro Company. Toro is the the founding sponsor.

"Golf course superintendents are key members of the golfing industry. They have made and continue to make major contributions to the game," says Hoffman. "It is our hope that they will receive the recognition in this special Hall of Fame that they have earned through hard work, expertise, and dedication to the game." □

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SEED

New bluegrass variety gets raves from the Univ. of Idaho for quality and practicality

WORLEY, Idaho — A new Kentucky bluegrass combines quality with practicality, according to the University of Idaho.

The variety Alene has a medium/dark genetic color and improved disease resistance compared to the common types of grass generally grown, according to a press release from Seeds West and Seeds Inc. "Alene may also be the answer to homeowners and others who need a low-maintenance lawn because it develops a durable, attractive, drought-resistance turf," the press release notes.

In tests, 71 percent of Alene seedlings emerged in 10 days or less, providing quick ground cover in areas that would normally be subject to erosion.

"In 40 days after planting, Alene can be expected to produce 12 tillers for each seedling compared to seven for other popular varieties," the press release notes. "Alene is a vigorous variety and compares well to such varieties as Baron, but will spread as much as 45 percent faster, according to data submitted for the patent application."

For more information, contact Seed West, P.O. Box 113, Rockford WA 99030 or Seeds Inc., Rt. 2, Box 28, Worley, ID 83876. □

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IRRIGATION

Picking a turfgrass is a key

RIVERSIDE, Calif. — Turfgrass researchers at the University of California Riverside are advocating a new philosophy in selecting and irrigating turf that will significantly increase water conservation and reduce irrigation costs.

Based on the results of a four-year study published in a recent issue of *California Agriculture*, UCR investigators say that it is now an obsolete practice to select one grass and one irrigation schedule for an entire area, such as a golf course, park or home lawn.

"In areas receiving little or no wear, there is no need for irrigation regimes that support recuperative ability from heavy foot traffic," observes Dr. Vic Gibeault. "We have shown that irrigation water can drop to 20 percent of normal for these grasses, and they still look green, have a uniform appearance and give adequate ground cover in non-use areas.

To conserve water, turf types and irrigation schedules should vary and be determined by use patterns.

One half of the 1.4 million acres of turf used on golf courses, parks and home lawns must be maintained with optimum irrigation water for grass to recuperate from wear and tear. The other 50 percent of the turf receives minimal foot traffic because it is located near clubhouses, along fairways or in remote places of the park or lawn.

This is the first time researchers have identified which grasses respond well to severe irrigation cutbacks in California.

Bermudagrasses and seashore pasaplum performed best in the UCR study. Two species of saltbrush, buffalograss, and two varieties of Phalaris also gave comparitively good cover and quality under irrigation stress in low-traffic areas.

"Most people just understand the amenity value of turf," Gibeault continues.

Water scarcity in California led to the search for attractive grasses with low water needs. □

Musser receives promo donation

CLEVELAND — The H.B. Musser International Turfgrass Foundation recently received a donation from Lesco, Inc. that represented the latter's redemption of Certified Blue Tags though Turf-Seed Inc.'s Blue Tag promotion program. Above, Lesco vice chairman Robert Burkhardt (left) presents MITF president Frank Dobie with a check for the donation. Dobie is superintendent at The Sharon Club in Sharon Center, Ohio.

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A John Deere AMT® All Materials Transport won't leave you in a rut.

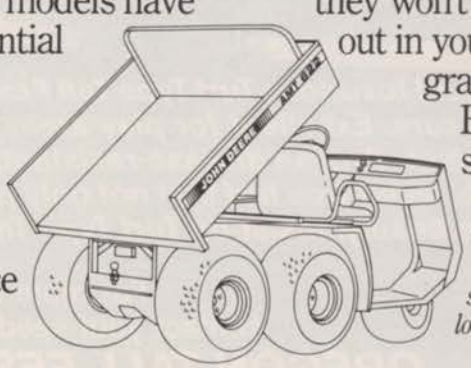
Basically because its high-flotation design won't leave any behind.

Which makes the AMT hauler the perfect choice for taking 600*-pound payloads across ground most grounds care managers consider sacred.

To keep your turf further intact, both models have true differential drive. So they won't tear up your turf turning.

And since their transmission features a smooth-engaging centrifugal clutch, they won't be patching out in your perennial grass either.

But what really separates an



Tilting cargo bed with optional hydraulics speeds unloading of loose materials.

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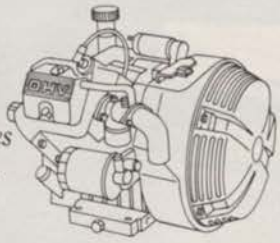

Both the 8.5-hp and 10-hp models feature Kawasaki 4-cycle engines for reliable performance.

AMT transport from traditional trucks is its price (starting at only $3,699**). And that's a fact that means an AMT won't sink too far into your budget, either.

See your dealer for full details on both AMT transports soon. Or write John Deere, Dept. 84, Moline, IL 61265 for more facts.

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ATHLETIC TURF

Baseball fields in U.S., Canada cited by STMA

HOUSTON — The Baseball Diamond of the Year awards were announced earlier this year with ballparks in Canada, Florida and Minnesota winning top honors.

The Sports Turf Managers Association's (STMA's) professional baseball award was given to Mike Regan, head groundskeeper at Labatt Park, home of the London (Ontario, Canada) Tigers of the Class AA Eastern League.

The college baseball award was presented to Jerry Brown, head athletic groundskeeper for Barry University's Buccaneer Field in Miami Shores, Fla.

The winning diamond for schools, municipalities and parks is Legion Field in Marshall, Minn. The award was presented to Mark Altman, facility consultant to the Marshall Parks and Recreation Department.

Four major league groundskeepers (one for each major league division) served as judges: Jim Anglea of the Texas Rangers, Pete Flynn of the New York Mets, Harry Gill of the Milwaukee Brewers and Steve Wightman of the San Diego Padres.

The awards were presented at the annual meeting of the STMA here. They are given each year on the basis of excellence in maintaining outstanding, safe, professional-quality baseball facilities. Co-sponsors are Beam Clay, the STMA and *Golf & Sports Turf* magazine. □

LITERATURE

Service guru has new book

MINNEAPOLIS, Mn. — Service guru Ron Zemke, who was keynote speaker at the 1988 Professional Lawn Care Association of America conference in New Orleans, has a new book on the market.

Zemke, author of *Service America!*, has written *Service Wisdom*, a collection of his writings designed to be a service resource. He and Dick Schaaf also wrote *The Service Edge: 101 Companies that Profit from Customer Care*, which builds on his original work.

For more information on any of the publications, contact Zemke's company, Performance Research Associates, at (612) 338-8523 or New American Library Books at (212) 397-8132. □

CONFERENCES

Turf course to be offered in Davis

DAVIS, Calif. — "Turfgrass Management for Professionals," focusing on current techniques and research results, will be held here April 12-13. The course is sponsored by the University of California Extension-Davis. Ten hours of pest control advisors (PCA) and 1.5 hours of certified golf course superintendents courses have been applied for.

The curriculum should be of interest to golf course superintendents, park and recreation site managers, horticultural consultants, pest control advisors and other professional turf and landscape managers.

To receive program details, write or call University Extension, University of California, Davis, CA 95616; (916) 757-8899. □

Next month:

- **Post-emergence Weed Control Guides for cool-season and warm-season areas**
- **Annual listing of "Top 50" landscape contractors in the U.S.**
- **Guide to Irrigation Installation**
- **Flowers for your golf course**

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If you haven't checked out the Professional Grounds Management Society recently, then you're in for a surprise. We're offering a bundle of new benefits that make joining PGMS more rewarding than ever! Here's what we've been up to and how you can benefit:

ANNUAL CONFERENCE AND TRADE SHOW - The yearly forum bringing together grounds managers, top speakers, and suppliers for the sharing of knowledge and ideas.

NEWSLETTERS - A newsletter is mailed monthly to keep members current on the affairs of the Society and the latest developments critical to successful grounds management.

CERTIFICATION - Voluntary peer review of acceptable competence to enable you to become a Certified Grounds Manager.

RETURN OF DUES PROGRAM - All renewal dues will be credited to your return of dues account. Upon retirement all renewal dues paid by you will be refunded.

INSURANCE - Included in your membership fee of $5,000.00 accident and dismemberment insurance.

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Rubigan® covers your course against dollar spot, anthracnose and patch diseases.

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Only Rubigan is labeled to prevent and treat all five. Not to mention nine other common turfgrass fungal diseases. So why take chances controlling only part of the patch disease problem? Rubigan gets them all.

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Long before you step behind a Woods walk-behind mower, we've been behind the scenes planning, designing and testing in order to produce the highest quality commercial walk-behind mower that money can buy. And it's our accumulation of over 42 years experience, engineering expertise and technical know-how in professional turf maintenance equipment that keeps Woods ahead of the pack.

Ahead in features. Changing speed with a Woods walk-behind is smooth thanks to the heavy-duty hydrostatic transaxle drive. There is no gear changing--clutching is eliminated. Steering is precise and effortless with our dual disk brakes and speed controls. Woods walk-behinds feature reverse for the ultimate in mowing efficiency and convenience.

For reliable, day-in and day-out performance, Woods walk-behinds are powered by Kohler-Magnum series engines. The rugged mower deck is welded 10 ga. steel with double reinforced side skirts. Large 16" dia. drive tires provide 10-1/2" ground clearance.

Ahead in performance. Woods hydrostatic transaxle drive system eliminates belts that slip when wet. Even under adverse weather conditions the drive wheels continue to turn.

Operation couldn't be simpler as one lever controls direction and speed. You can go from a top speed of 6 mph to a crawl or even to reverse in an instant with Woods finger tip controls. When mowing productivity is important, Woods walk-behinds are unbeatable performers.

Ahead in reliability. You can bank on trouble-free mowing with Woods. The simplified design reduces the number of operating components. Heavy-duty construction stands up to the most demanding commercial applications. As the world's largest manufacturer of tractor powered rotary mowers and shredders, we've applied our know-how to producing this line of durable commercial mowers.

For more information on Woods walk-behind mower series in 36", 48", and 61" mowing swaths, write Woods, Dept. **LM**, Oregon, Illinois 61061 or phone 815/732-2141.

WOODS

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Circle No. 170 on Reader Inquiry Card

CONVENTIONS

Barbara Mandrell to visit Expo '90

LOUISVILLE, Ky. — Country rhythm-and-blues singer Barbara Mandrell, one of the nation's most popular and dynamic performers, will entertain visitors to the International Lawn, Garden & Power Equipment Expo here this summer.

Mandrell has received nine People's Choice Awards, including six consecutive as "Favorite All-Around Female Entertainer." The petite songstress is a show business veteran of 29 years with such hits as "Midnight Oil" and "If Loving You Is Wrong (I Don't Want to Be Right)."

Her concert is scheduled for Monday, July 30 at the Commonwealth Convention Center in downtown Louisville. The "Expo Evening Starring Barbara Mandrell" will include a buffet dinner. Cash bars will open at 6 p.m. and Mandrell will perform at 8 p.m. Free transportation will be provided between several convention hotels and the dinner show.

Barbara Mandrell

Tickets cost $30 each for dinner and the show. They may be ordered through the Expo advance registration brochure, which will be available in April by calling (800) 558-8767.

The ILPGE Expo '90 for dealers, distributors and others involved in the landscape industry will be held July 29-31. □

Circle No. 154 on Reader Inquiry Card

ATHLETIC TURF

Penn State coach gives turf managers new name

VALLEY FORGE, Pa. — Athletic turf managers in search of a title need look no further, thanks to retired Penn State University soccer coach Walter Bahr.

Bahr, father of two National Football League placekickers, surveyed attendees at the Eastern Pennsylvania Turfgrass Conference, asking what to call the audience. He decided on "SOLMAD," the acronym for "Superintendent Of Landscape Management And Development."

"I always thought you just had a guy out there who cuts the grass that you called 'Charlie' or something like that," he admitted.

Bahr offered a coach's perspective on turf management, saying that his first choice of surface as a coach and player is natural turf. His least favorite surface is Astroturf.

"My objection to Astroturf is that it always hurt. Even to walk on it hurt you," said Bahr. "When we used to have to play a game on Astroturf we never practiced on it the day before because you'd always wind up getting a couple of kids hurt before a game."

Bahr said he agrees totally with former Philadelphia Phillies slugger Richie Allen who quipped, "If horses won't eat it, I don't want to play on it."

Bahr said he'd rather have a dirt field void of grass than to play on the synthetic Astroturf surface. "So anything a 'SOLMAD' does to take care of the field is okay with me."

Santa Anita turf too fast?

The new turf track recently installed at the Santa Anita race track is causing consternation among managers there. The hybrid Bermuda grass with an interlocking mesh element is resulting in faster times. Should records posted on the new track replace old records, or be given a new category? Ray Rogers, general manager for the Oak Tree group of horses, trainer Bruce Headley and racing expert Jim Quinn are in favor of new categories. Cliff Goodrich, president of Santa Anita, is not. Goodrich says the track has been changed before, and new times were always compared with existing times. Jockeys say the horses don't seem to get as tired on the new turf.

You never know what's hit you when you see patch disease. It could be Fusarium blight. Or necrotic ring spot. Or summer patch. Or take-all patch. Or spring dead spot. Or any combination.

They all look very similar on turf. Only with a microscope can you tell them apart. So guessing which one's causing your patch disease still leaves your turf open to the other four.

That's why complete coverage pays. And only Rubigan is labeled to prevent and treat all five of these pathogens that cause patch disease.

Not to mention dollar spot, snow mold, copper spot, red thread and stripe smut. And this spring is an excellent time to begin your preventive program.

Why take chances controlling only part of the patch disease problem? Span the spectrum with Rubigan. See your Elanco distributor. Or call toll-free: **1-800-352-6776.**

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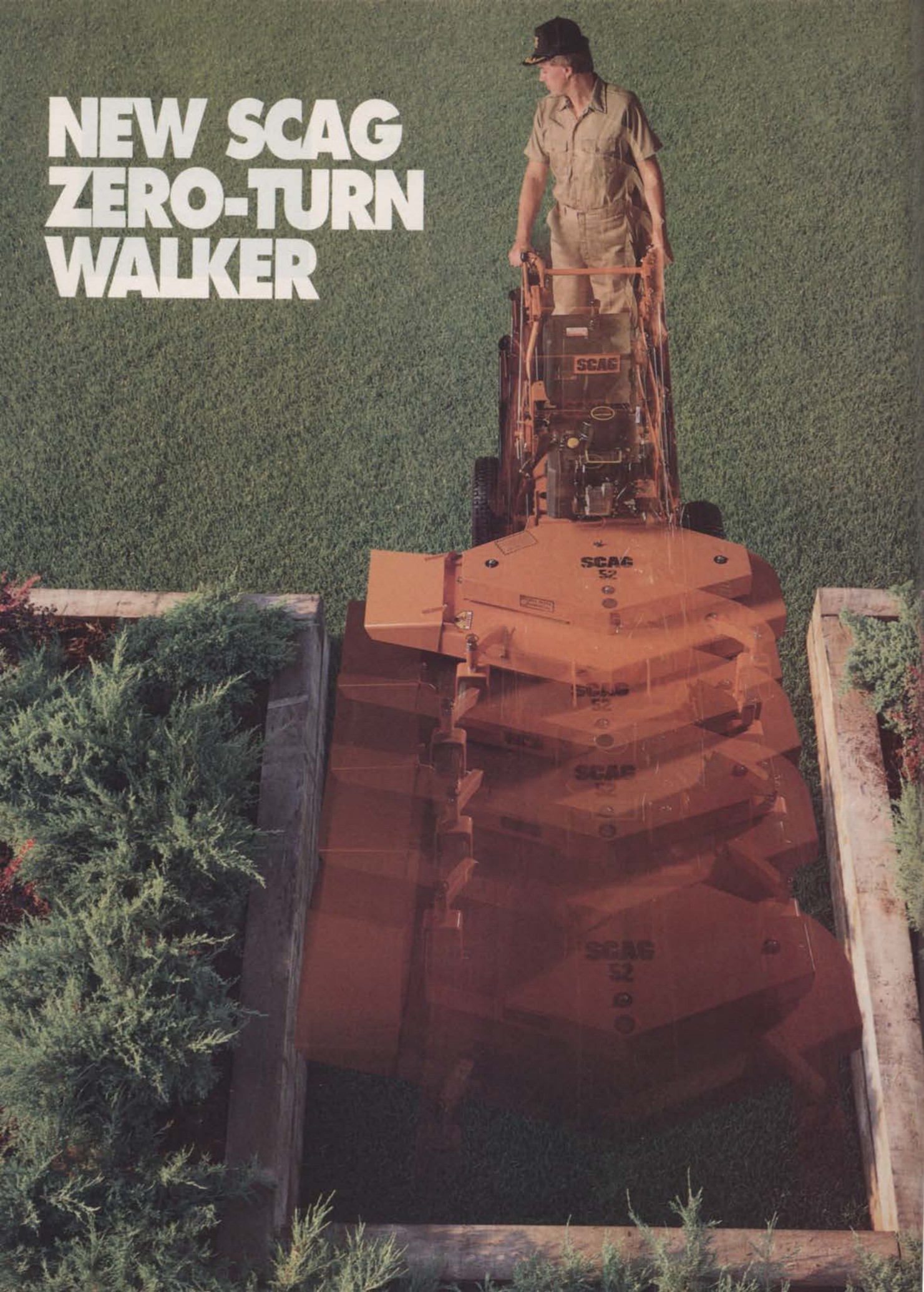
Only Rubigan® spans the patch disease spectrum.

NEW SCAG ZERO-TURN WALKER



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Just a squeeze of the controls. That's all it takes to move Scag's new zero-turn, dual-hydro walker from forward to neutral to reverse. Scag's unique control system allows you to select variable speeds for efficient, comfortable mowing. From fast to slow and anything in between. With independent power to each wheel, hillside cutting

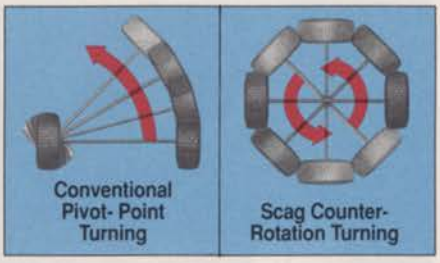
is more accurately controlled. And with positive reverse, you can back out of a tight spot or up an incline.

Cast-Iron Hydro Drive

Two heavy-duty White motors and two Sundstrand pumps combine to give this new Scag walker the smoothest operation in the business. This heavy-duty cast-iron motor drive system is engineered to last the life of the machine.

No-Scuff Turning

Everyone knows how to turn a commercial walker. Simply lock up one wheel and drive forward with the other. But look at the lawn



when you're done. Turf scuffed. Wheel marks everywhere. Scag's zero-turn walker turns on a dime without leaving any damage. That's because Scag's unique design allows one wheel to rotate forward while the other rotates in reverse. It's the smoothest turning machine in the world.

Unmatched Cutting Performance

When it comes to a smooth, manicure-finish cut, nobody beats Scag. An extra-wide discharge chute disperses grass so well that catchers are often unnecessary. The walker's wide stance means virtually no scalping. And larger tires provide better flotation, traction and curb climbing. The Scag zero-turn walker simply gives you better cutting performance than any other machine.

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Each component of the drive system can be easily removed or serviced in minutes. That means less down time and less labor cost. Unlike complicated hydrostatic transaxles, you simply replace one component, instead of the entire system. And Scag backs this new drive system with a two-year commercial warranty.

Try the new Scag zero-turn, dual-hydro walker at your Scag dealer today.

SIMPLY THE BEST

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FLORIDA'S BEST

The leading golf course superintendents the Sunshine State are driven to perfection by personal pride and golfer demand for exquisite conditions.

Whit Derrick emphasizes the personal pride he feels when the golf course is looking its absolute best.

Jay Gratton of Orchid Island suggests a younger man come down to Florida to work as an assistant for a couple of years. Then a move up is more likely.

by Terry McIver, associate editor

It's 9:02 a.m., and I'm officially late for my meeting with Jim Ellison at Orlando's Bay Hill Club. That last left turn should have been a right.

I know that two minutes isn't bad for someone bopping around between half a dozen Florida towns interviewing golf course managers. It's just that, to these guys, time is like water; it's a precious resource you always want more of but never seem to have.

The only "slow" time in Florida is during the summer, which provides a slight break in play. But it's still a 12-month season, and breathing room is at a minimum.

My mission was to learn what goes into a "typical" day for these guys, and what an interested Yankee who's tired of ice and snow might face in the Sunshine State. Like the ad says, "This is Florida. The rules are different here."

Unless you've been camping in the Himalayas for the past few years, you know that golf course construction in Florida is booming. The state leads the nation in number of courses (932) and in courses being planned (53). To belabor the obvious, the climate is always right, and it continues to draw vacationers or second-home buyers from northern locales. The weather, tourism, and the need to live up to the reputation of the perfect golf experience make for busy days and short lunch breaks for superintendents here.

"We're in the business because we love the game of golf," says Ellison, who remains calm in the midst of all the activity around him.

"The most rewarding part of our day is bringing the course to an excellent, well-groomed, well-manicured condition. We're working with nature. Our daily programs are scheduled around the behavior of the elements. When you can accomplish what you set out to accomplish, it's pretty satisfying."

The love of golf is bred into the most successful and concerned managers. Ellison says he "grew up on a golf course" in Jacksonville, Fla., and his father, too, was a superintendent.. Schooling at Lake City Community College, the place to go in Florida to study turf, was a foregone conclusion.

The goals of the Florida superintendent are often out of reach due to the sheer number of players who descend on their courses daily. Upwards of 200 rounds (on a slow day) makes goal-setting a game of hit-and-miss if not done well. Ellison admits that in most cases, the satisfaction is short-lived. "But then, with 500 to 600 golfing members, it's a different set of circumstances."

One man, many bosses

That's the great equalizer: the member-owned, equity club. Once a course is sold to resident members, each member becomes a boss. And each boss wants something different.

But Ellison is philosophical about it. "They (members) are demanding, but I'm demanding myself," he reasons. "I know what it takes to accomplish what the members want. We also have several touring pros here, and they have high standards right from the start."

"Private club members are indeed demanding, says Whit Derrick, the well-known superintendent of Sugar Mill near Daytona, "because they want their golf course to be perfect.

"A member may make a request that's hard to justify and follow through with," relates Derrick. It's a situation soon dealt with at monthly meetings. "Ninety percent of the time the member request cannot be met, but you want to be diplomatic about it," explains Derrick, who says giving the members the "straight facts" is the best approach.

Roger Welker runs the Sandridge Country Club, a public course in Vero Beach. Another Lake City graduate, he began his career with a four-year stint at Martin Downs, a private course. He cites amount of play as a major difference between public and private courses. "We play 70,000 rounds a year, and they really beat it down."

Welker describes his customers as a mixed bag of personalities, the same as you'd find at any public links.

"Thirty percent play often and treat the course well, as if they were members. Another 30 to 40 percent play once or twice a week, and treat the course well. Then there are the 'weekend warriors' who more or less abuse the course and have poor judgement."

Summer is a time of intense renovation and catch-up at all Florida courses. Compaction problems require aerification, and the grass itself is tired and worn. "We also require more fertility than private clubs, again because of more play," continues Welker. "We probably put out more nitrogen to grow out of the compaction. At the private club, we'd back off the fertility in summertime; we didn't want to grow that much turf. We wanted it healthy but didn't want to spend all summer cutting grass. Here, we have to grow grass to grow out of the wear caused by constant golf."

Dues at member clubs are based on what it's going to cost to achieve a break-even point in the budget. Welker says this means there can be no more going over the budget, because the developer isn't there to pick up the slack.

"Yes, it is different," says Welker of the growing conditions, but adds that it can eventually be learned.

"There are different grasses, diseases and pests. But basically, grass is grass. Once you understand the grass you can adjust."

Job changes common

Welker and others estimate that the average, aggressive Florida superintendent might change jobs every two to four years, for one of three reasons.

"The development might close due to money difficulties. Also, at private clubs you have to deal with greens committees, and a lot of supers can't handle that. And then there's the search for the perfect assignment," which to Welker just doesn't exist.

Keep in mind the heat, the higher cost of living and the 12-month season. "And be prepared to put in 55-hour weeks," warns Derrick. "The more prestigious the club, the more the work. Sometimes it's a seven-day week."

Despite the demands these jobs can place on personal time, openings don't last long. They're filled quickly, often over the phone. Jobs must be filled quickly for the sake of the course, and competition is fierce.

Ray Hansen, current vice president of the Florida Golf Course Superintendents' Association and superintendent at the Ocean Reef Club in Key Largo, began his career in New Jersey.

He agrees that working as a Florida superintendent has its plusses and minuses. "You can keep your crew year-round and give them more benefits, paid vacation, and so forth," says Hansen. "But as far as play, it's easier to keep the course open all year round

NOT SUCH A GOOD IDEA?

Tim Hiers of the John's Island Club most adamantly suggests that superintendents from the northern U.S. should stay where they are. His reasons are valid, and it's something he seems to have given much thought. What would a Northerner who is sharp, smart, and wants to explore opportunities in Florida have to do to make it down there?

Tim Hiers

"He could have an IQ of 200, a degree from Cornell in business administration, and a turf degree from Penn State, and it would be a mistake to come down here and take a job as a superintendent," Hiers says. "This is not a place that you can take as a training ground. You have to understand mole crickets thoroughly, understand that the fertility program is totally different, the grasses are totally different."

"Treating people is the same," he adds, "especially in light of environmental situations, which are totally different here.

"I wouldn't recommend superintendents from the South going up North either," he continues. "I've seen and heard of guys who've come down and have tried to apply the same standards and they're not very successful.

"And I'm not saying that to be smug. You don't get a week's rest to work on equipment; you don't have a tear-down period. We have four greens seasons. Our basic grass is bermuda, then we have transistion into overseeded grass. Then we have to maintain the overseeded grass on top of the base grass; then we have transition from overseeded grass back to the base grass. Up there they stick with one grass."

—Terry McIver□

than it is to open and close it, prepare for snow mold, et cetera.

"In South Florida, we don't have to overseed. Generally speaking, you don't have many disease problems in bermudagrass. But you've got to know irrigation."

Voice of experience

Roger Harmony, superintendent at Meadowood Country Club, St. Lucie, spent 30 years tending courses in Connecticut and New York before heading South. His successful move to Florida was prompted by a desire to escape from Northern winters.

"The biggest challenge," he explains, "has been maintaining the bent greens under the intense heat and humidity, which can last for eight months." (Most Florida courses have bermuda greens. Meadowood is an exception.)

"The 12-month season plays havoc with equipment," continues Harmony. "Equipment turnover occurs every three to five years rather than every five to seven years."

Harmony began his Florida career at Martin Downs, a job he found by looking around during a visit. Harmony's advice echoes the others: "Don't expect to land a super's job. Spend a year working under someone as an assistant, probably two."

But first, come down and see for yourself. Harmony says he often receives visits from interested Northerners, and he's happy to advise. His final words: "They need Class A irrigation people and top flight mechanics. Otherwise, the project will fold."

Development picture

Derrick describes opportunity in Florida as "almost unlimited. The state is growing so fast, it can't keep up with

BUILD A COURSE, BUILD A LIFE

This April's opening of DeBary Plantation in DeBary, Fla. marks the end of superintendent Mike Kenovich's journey from hard times to greener pastures.

His story is one of a man's determined effort to build a better life when it gets rough. Mike Kenovich has been reincarnated.

Mike Kenovich has plenty to smile about. He knows life can begin whenever you want it to.

Until 1982, Kenovich had been a steel worker in Pittsburgh. The steel industry had begun to rust; Kenovich lost his job to 25 percent unemployment, and life became a struggle. Kenovich did his best, and kept his family together by working a variety of side jobs.

On the invitation of his father-in-law, Kenovich and family moved to Florida to start over.

"I started by working one year for the Melbourne Public Works Department, making $4.25 an hour," Kenovich remembers. "I had always liked golf, and that led me to answer an ad for golf course personnel at Sun Tree Country Club."

It was three months before a Senior PGA tournament, and the course needed men. "Ron Andrews was the superintendent," remembers Kenovich, "and he took a chance on me. He trained me on fly mowers and weed whackers, and I'd do a variety of clean-up chores."

Kenovich was kept on after the tournament, and over the next year became familiar with all types of golf course mowing.

After an eight-month stint as a buyer and assistant grower for an Orlando nursery, Kenovich was back in golf.

"Whit Derrick, who had been the assistant superintendent at Sun Tree, became the superintendent at Pelican Bay. So I came to work with Whit."

"Mike's strongest asset is his dedication," says Derrick (now at Sugar Mill), who has known Kenovich for seven years. "In fact, he is the most dedicated employee I ever had. He has outstanding potential as a superintendent."

Kenovich was charged with reconditioning one-half of Pelican Bay that had been out of use for months. The course was opened in January of 1985. He was was then trained as a chemical technician. For 18 months he did all spraying and record-keeping, then moved on to learn irrigation systems.

"In April 1986, I went with Whit to be his assistant at Sugar Mill. I was in charge of a crew there for three years. I was then contacted for this postion at DeBary."

The Mike Kenovich story is a perfect example of determination and goal realization.

"The keys to my success," he says quietly, "have been that I applied myself, was aggressive, did a good job and had some good breaks. There was also good timing and luck."

Kenovich is thankful for his success. He has an extremely positive attitude and easy-going nature. In the midst of all the noise and bustle from earthmovers and bulldozers, Kenovich remains calm. He knows the job will get done; no problem.

Kenovich's success is magnified by the fact that he has had no formal turf education. Night classes were desirable, but never materialized because of family commitments. So Kenovich studied on his own. He attended seminars and read all he could: books on turf, trade magazines, cooperative extension material, and various USGA articles. "I also realized that each job was important," he says, "and that it had to be done right."

Epilogue: Nothing fancy

Lessons to be learned from the Mike Kenovich story are simple and older than the game itself: fortitude, persistence and taking risks are keys to success. And with the continued growth of golf, similar opportunities continue to appear for anyone who wants to play.

—Terry McIver□

Palmetto Dunes CC, Hilton Head, SC

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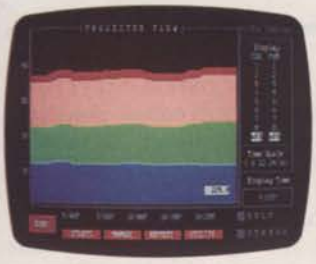

If you want your golf course to sparkle with the beauty and playability golfers expect, then you need the best irrigation system you can find: TORO. Palmetto Dunes chose Toro.

Toro control systems help you develop superior turfgrass and save money at the same time. Toro sprinkler heads, with low precipitation rates, apply water more effectively and more efficiently, taking you another step toward better turfgrass, while saving you water, energy and money.

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3. Sequential Multi-Manual—Toro also gives you the flexibility to program from the satellites for such vital functions as removing frost or cooling turf. In effect, it can lengthen your playing day.

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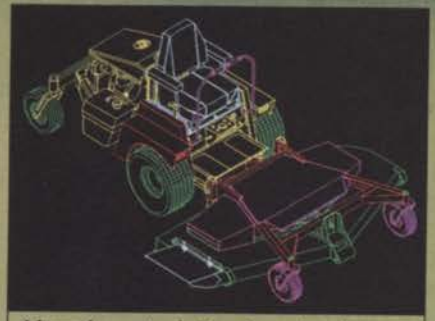

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itself."

Derrick says the resort/home course market is "region oriented." More public facilities are in demand, but the trend is toward equity award clubs. Five have been built in the Orlando area alone in the last two years.

"The population growth in Florida is tremendous," marvels Tom Alex, superintendent at Grand Cypress Resort.

"Developers are using golf courses to lure people into buying," he explains. "Some are using name player/designers as an added attraction. And local architects such as Lloyd Clifton are producing excellent golf courses.

'Yes, private club members are demanding, but I'm demanding myself; I know what it takes to accomplish what the members want.'

—Jim Ellison
Bay Hill Club

"It's a buyer's market," says Alex. "If you're in the golf course construction business and aren't busy, you'd better get out."

There is indeed a need for many more public golf courses in the state. But most say that building a public course and paying for it with green fees is very difficult.

"What's going to happen in the future with public golf courses," predicts Alex, "is that they're still going to be tied up with developers. And you might run into situations in which the developer might give somebody 150 acres of land and say, here, you put a golf course on it. Yes it can be a public facility, but I'm still going to put houses around it. But the days are gone where somebody buys the land, puts a golf course on it and pays for it, unless they have out of pocket cash."

Take your best shot

No one down here suggests quitting a job before you find a job; experts in any profession would say the same. But given the opportunity throughout Florida and the profession overall, a well-planned search could be successful for the qualified candidate.

The best advice is to plot your career goals, have confidence in your ability, realize the vast differences between North and South, and be willing to work your way up. **LM**

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USING PRE-EMERGENCE HERBICIDES...

All of the 14 pre-emergence herbicides reviewed by the author are effective against annual bluegrass. Choosing the correct one requires a knowledge of the turfgrass and weed species on the site.

... ON WARM-SEASON TURFGRASSES

What do you get when you cross pre-emergence herbicides with proper maintenance practices? Beautiful, weed-free turfgrass, that's what.

by Tim R. Murphy, Ph.D., University of Georgia

The effectiveness of pre-emergence herbicides is directly related to cultural practices and insect and disease control programs that promote a dense, vigorous turfgrass cover. Properly maintained warm-season turfgrasses are extremely competitive with weeds.

Prior to using a pre-emergence herbicide, cultural practices such as fertilization, irrigation, cultivation, and clipping height and frequency should be reviewed and matched to the needs of the particular turfgrass species. Insect and disease problems should also be controlled.

Unbeatable combo

When used in combination with approved cultural practices and insect and disease control programs, pre-emergence herbicides will control susceptible weeds for two to four months after application.

Post-emergence herbicides may also be needed on some sites to control problem weeds, such as dandelion, nutsedges and dallisgrass, that are not controlled by pre-emergence herbicides.

The importance of meeting the cultural needs of the turfgrass and controlling insects and diseases cannot be over-emphasized. Herbicides supplement the level of weed control

Golf course superintendents and lawn-and-landscape managers depend on Bensumec™ 4 LF because it's the *one* pre-emerge that they can trust to get poa annua, crabgrass and other grassy weeds. Spontaneous emulsification assures easy mixing with any Trimec® Complex; Ferromec® AC Liquid Iron; Embark® Plant Growth Regulator; and high-nitrogen liquid fertilizers.

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Bensumec 4 LF is the ideal pre-emergence herbicide for tank mixing with Super Trimec. Together they give you a double barrel shot that you can fire *once* — early in the spring — and know for sure that you're going to control the over-wintering broadleaf annuals and the other toughies like poa, crabgrass, goosegrass, plus henbit, lambsquarter, redroot pigweed, and shepherdspurse.

Just think what it can mean to your entire spring program to get this important weed control program out of the way — in one shot — early in the season — at a time when you might not have any other constructive things to do.

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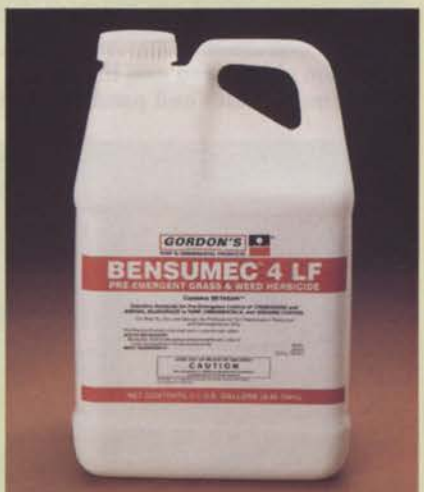

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728-190

Common chickweed and henbit are easily controlled with benefin, benefin + oryzalin, oryzalin and pendimethalin. See table 4.

Goosegrass is susceptible to spring-applied, pre-emergence herbicides.

that is obtained from the inherent competitive ability of a properly maintained warm-season turfgrass. Avoid a strict reliance on herbicides without regard for other management practices in the overall weed control program. This will not result in a high quality, aesthetically appealing warm-season turfgrass.

Important tools

Pre-emergence herbicides form the foundation of a chemical weed control program. They are primarily used for the control of crabgrass species, goosegrass and winter annual weeds.

Post-emergence herbicides control these weeds, but usually more than one application is required and often the turfgrass is injured for a short period of time after application.

In the past years there were only four to five pre-emergence herbicides available for warm-season turfgrasses. However, there are now 18 herbicides or herbicide combinations registered for pre-emergence use on warm-season turfgrasses (Table 1).

Isoxaben (Gallery) is the newest registration. It was labeled in 1989 for pre-emergence weed control in both cool-season and warm-season turfgrasses. Isoxaben effectively controls a wide range of summer and winter annual broadleaf weeds, but is not effective for the control of crabgrasses and goosegrass. Additionally, dithiopyr (Dimension) and prodiamine (Barricade) are in the final stages of the registration process and may be available for use in 1990.

Factors to consider

It is extremely difficult to name one pre-emergence herbicide that would be "best" for all turfgrass weed control situations. Several factors must be considered before selecting a pre-emergence herbicide. Selection should be based on turfgrass tolerance and the weed species compostion of the site. Herbicide selection based solely on cost may result in possible turfgrass injury and/or the additional expense of a follow-up post-emergence herbicide application.

There are significant differences in the tolerance of warm-season turfgrasses to pre-emergence herbicides (Table 2). For example, zoysiagrass and bermudagrass have excellent tolerance to atrazine when dormant, but may be discolored or injured if applications are made during the summer months. In contrast, centipedegrass and St. Augustinegrass have excellent tolerance to atrazine at all times of the year, with the possible exception of

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TABLE 1.

COMMON AND TRADE NAMES OF WARM-SEASON TURFGRASS PREEMERGENCE HERBICIDES.

Common Name	Company	Trade Name and Formulation[1]
atrazine	Royalgard	Purge 4 lbs./gal.
	Ciba-Geigy	Aatrex 4L, 90DG, 80W
benefin	Elanco	Balan 2.5G, 85DF
	Lesco	2.5 Benefin Granular (2.5G)
benefin + oryzalin	Elanco	XL 2G
benefin + trifluralin		ElancoTeam 2G
bensulide	ICI	Betasan 2.9E, 4E, 3.6G, 7G, 12.5G
	Royalgard	Roysan 4E, 12.5G
	PBI/Gordon	Betamec 4LF
	Lesco	Lescosan 4E, 7G
bensulide + oxadiazon		ScottsGoosegrass/Crabgrass Control 6.5G
DCPA	Fermenta	Dacthal 75W
dithiopyr[2]	Monsanto	Dimension 1EC
ethofumesate	Nor-Am	Prograss 1.5EC
fenarimol	Elanco	Rubigan 1AS
isoxaben	Elanco	Gallery 75DF
napropamide	Lesco	Devrinol 5-G Ornamental
	ICI	Devrinol 50WP, 5G
oryzalin	Elanco	Surflan 4AS
oxadiazon	Rhone-Poulenc	Ronstar 2G, 50W
pendimethalin	Lesco	PRE-M 60DG
	Scotts	Southern Weedgrass Control 2.45G
		Turf Weedgrass Control 1.71G
		Weedgrass Control 60DG
prodiamine[2]	Sandoz	Barricade
pronamide	Rohm-Haas	Kerb 50W
simazine	Ciba-Geigy	Princep 80W, 4L, 90DG, 4G

[1]Numeral refers to percent or pounds of active ingredient.
[2]Registration pending Environmental Protection Agency approval.

TABLE 2.

WARM-SEASON TURFGRASS TOLERANCE TO REGISTERED PREEMERGENCE HERBICIDES.

	Turfgrasses				
Herbicide	Bahia-grass	Bermuda-grass	Centipede-grass	St. Augustine-grass	Zoysiagrass
atrazine[1]	NR	T(D)	T	T	T(D)
benefin	T	T	T	T	T
benefin + oryzalin	T	T	T	T	T
benefin + trifluralin	T	T	T	T	T
bensulide	T	T	T	T	T
bensulide + oxadiazon	NR	T	NR	NR	T
DCPA	T	T	T	T	T
ethofumesate[2]	NR	T(D)	NR	NR	NR
fenarimol	—	T	—	—	—
isoxaben	T	T	T	T	T
napropamide	T	T	T	T	NR
oryzalin	T	T	T	T	T
oxadiazon	NR	T	NR	T	T
pendimethalin	T	T	T	T	T
pronamide	NR	T	NR	NR	NR
simazine	NR	T	T	T	T

[1]When dormant, bermudagrass and zoysiagrass have good tolerance to atrazine.
[2]Ethofumesate is labeled for use on dormant bermudagrass that is overseeded with perennial ryegrass.
T = Tolerant at labeled rates; NR = Not registered for use on this turfgrass.

spring green-up.

Centipedegrass has not exhibited acceptable tolerance to the wettable powder formulation of oxadiazon (Ronstar 60W) in experiments conducted by the University of Georgia. Without a doubt, the herbicide label is the best reference to determine if a pre-emergence herbicide may be used on a particular warm-season turfgrass.

Pre-emergence herbicides should be used only on established warm-season turfgrasses. Newly-seeded and sprigged turfgrasses have a low level of tolerance and can be severely injured by most pre-emergence herbicides. Therefore, pre-emergence herbicide applications should be delayed until complete soil coverage has been achieved.

Post-alternative

An alternative to using pre-emergence herbicides during the "grow-in" of a warm-season turfgrass is to use post-emergence herbicides. Naturally there are exceptions, but many can be used during warm-season turfgrass establishment.

Pre-emergence herbicides persist in the soil for two to four months. The soil persistence characteristics of the these herbicides are advantageous in controlling weeds. However, establishment problems can occur if seeding, sprigging or sodding operations are planned for a particular site. Always consult the herbicide label to determine the length of time required before renovation operations can be safely conducted.

Timing applications

Pre-emergence herbicides are applied to the turfgrass site prior to weed seed germination. This group of herbicides controls susceptible weeds during the weed seed germination process. Pre-emergence herbicides do not affect the viability of dormant weed seeds.

Pre-emergence herbicides are applied in the spring for crabgrass and goosegrass control and in the fall months for winter annual weed control. Since most pre-emergence herbicides are not effective on emerged weeds, applications must be made prior to weed emergence.

Late February to early March applications generally provide better crabgrass control than later applications. However, in the cooler, mountainous regions of the South, the spring application may be delayed until late March or early April. For winter annual weed control, late August to early October applications are used depending upon the geographical location.

Cultural practices

Pre-emergence herbicides require rainfall or irrigation water to move them into the zone of maximum weed seed germination (e.g. the upper one to two inches of the soil profile). Recommendations vary slightly among the different pre-emergence herbicides, but unless one-fourth to one-half inch of rainfall occurs within seven days, the herbicide should be irrigated into the top two inches of the soil profile.

Spring scalping and subsequent mowings of warm-season turfgrasses should be delayed until after either rainfall or irrigation has removed the pre-emergence herbicide from the turfgrass foliage. Unless the herbicide has been washed from the foliage, mowing can remove significant quantities of the herbicide from the site.

Reducing thatch

A thick thatch layer has been shown to decrease the persistence of pre-emergence herbicides. Eliminating heavy thatch by cultivation (core aeration, verticutting, topdressing) increases herbicide contact with the soil and helps to prevent the accelerated breakdown of the herbicide in the thatch layer.

continued on page 46

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TABLE 3.
SUMMER ANNUAL GRASS CONTROL RATINGS FOR PREEMERGENCE HERBICIDES.

Herbicides	Crabgrass spp.	Goosegrass
atrazine	P	P
benefin	E	F
benefin + oryzalin	E	F-G
benefin + trifluralin	E	F
bensulite	E	P
bensulide + oxadiazon	E	G
DCPA	E	F
napropamide	E	G
oryzalin	E	F-G
oxadiazon	G	E
pendimethalin	E	F-G
pronamide	F	P
simazine	F	P

E = Excellent, ≥ 90% control. F = Fair, 70 to 79% control.
G = Good, 80 to 89% control. P = Poor, < 70% control.

TABLE 4.
WINTER ANNUAL WEED CONTROL RATINGS FOR PREEMERGENCE HERBICIDES.

Herbicide	Annual Bluegrass	Common Chickweed	Henbit	Parsley-Piert	Lawn Burweed	Corn Speedwell
atrazine	E	E	E	E	E	E
benefin	E	G	G	P	P	E
benefin + oryzalin	E	L	L	—	—	—
benefit + trifluralin	L	—	—	—	—	—
bensulide	F	P	P	E	P	P
DCPA	G	G	F	P	P	G
ethofumesate	G-E	L	—	—	—	—
fenarimol	G	—	—	—	—	—
napropamide	G	E	P	P	E	E
oryzalin	G	G	G	—	—	—
oxadiazon	G	P	P	G	P	G
pendimethalin	G	G	G	—	—	E
pronamide	E	E	P	P	P	E
simazine	E	E	E	G	E	E

E = Excellent, ≥ 90% control. F = Fair, 70 to 79% control.
G = Good, 80 to 89% control. P = Poor, < 70% control.
L = Weed species is listed on the herbicide label, but has not been evaluated by The University of Georgia.
— = Weed response is not known.
Source: Dr. Murphy

Cultivation has not been generally practiced or recommended after a pre-emergence herbicide application. Cultivation was believed to physically disrupt the herbicide barrier in the soil and stimulate weed emergence. Recent studies conducted in Georgia have shown that core aeration at various time intervals after a pre-emergence herbicide application did not stimulate large crabgrass and goosegrass emergence in bermudagrass. Data are not available for other weed species but it appears that core aeration does not influence the level of weed control that is normally achieved with a pre-emergence herbicide.

Summer control

Crabgrass (large, smooth, Southern) and goosegrass are commonly found in Southern turfgrasses. With the exception of atrazine, simazine and pronamide (Kerb), spring applications of pre-emergence herbicides will provide good to excellent control of crabgrasses (Table 3).

Goosegrass tends to germinate later in the spring than crabgrass and is more difficult to control. Single applications of oxadiazon (Ronstar) and bensulide + oxadiazon (goosegrass/crabgrass control) have provided high levels of goosegrass control in experiments conducted in Georgia.

Split applications, each at an interval of 8 to 10 weeks, of benefin + oryzalin (XL), benefin + trifluralin (Team), oryzalin (Surflan), pendimethalin (various trade names) and napropamide (Devrinol) will also give acceptable control of goosegrass.

Winter control

Similar to summer annual weeds, pre-emergence herbicides vary in their effectiveness on winter annual weeds. Bensulide has not generally provided the high level of annual bluegrass control that has been achieved with other pre-emergence herbicides (Table 4).

Common chickweed and henbit are easily controlled with benefin, benefin + oryzalin, oryzalin and pendimethalin. Additionally, DCPA (Dacthal), napropamide, ethofumesate (Prograss) and pronamide will control common chickweed.

Herbicides that have effectively controlled parsley-piert are bensulide and oxadiazon. Napropamide is effective for lawn burweed (spurweed) control. Good to excellent corn speedwell control has been obtained with benefin, DCPA, napropamide, oxadiazon, pendimethalin and pronamide.

Atrazine and simazine effectively control all the winter annual weeds shown in Table 4, either as a pre-emergence or post-emergence application.

Overseeded turfgrasses

On bermudagrass that is overseeded in the fall with perennial ryegrass, fenarimol (Rubigan) and ethofumesate may be used for pre-emergence control of annual bluegrass.

Ethofumesate should only be applied to bermudagrass that is completely dormant, since it can delay the spring green-up of bermudagrass when applications are made to bermudagrass that is not totally dormant. Spring applications of oryzalin, benefin + oryzalin and pendimethalin have been shown to decrease the stand of fall overseeded ryegrass.

These herbicides should not be applied to fall overseeded warm-season turfgrasses unless the goal is to hasten the spring transition by eliminating the perennial ryegrass.

Numerous pre-emergence herbicides are available to control summer and winter annual weeds in warm-season turfgrasses. Choosing the appropriate herbicide requires a knowledge of the tolerance of the various warm-season turfgrass species to the different pre-emergence herbicides and familiarity with the weed species found on a particular site.

Additionally, future renovation plans for the site must be known before a pre-emergence herbicide is used. Attention to the cultural needs of the specific warm-season turfgrass species and the timely use of both pre-emergence and post-emergence herbicides will enable the turfgrass manager to achieve the goal of growing a high quality, weed-free, attractive warm-season turfgrass. **LM**

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...ON COOL-SEASON TURFGRASSES

Identification, proper cultural practices and efficient herbicide applications are essential in order to control unwanted plants.

by Tom Fermanian, Ph.D., University of Illinois

Oh the lowly crabgrass plant: there's never enough of it in an area to make a decent turf, but it is the one grass that can be found just about everywhere.

Crabgrass and other annual grass species often represent a major headache to turf managers in cool, humid regions. This group of species, once germinated, seems to out-compete desirable turfgrasses.

Annual grasses generally become a persistent problem only in sparse turfs with open enough cover to allow young seedlings to germinate and grow. The best management of annual grasses is the proper management of desired turf species. Using cultural practices to promote healthy, dense turf minimizes the need for active annual grass controls.

Annual grass control

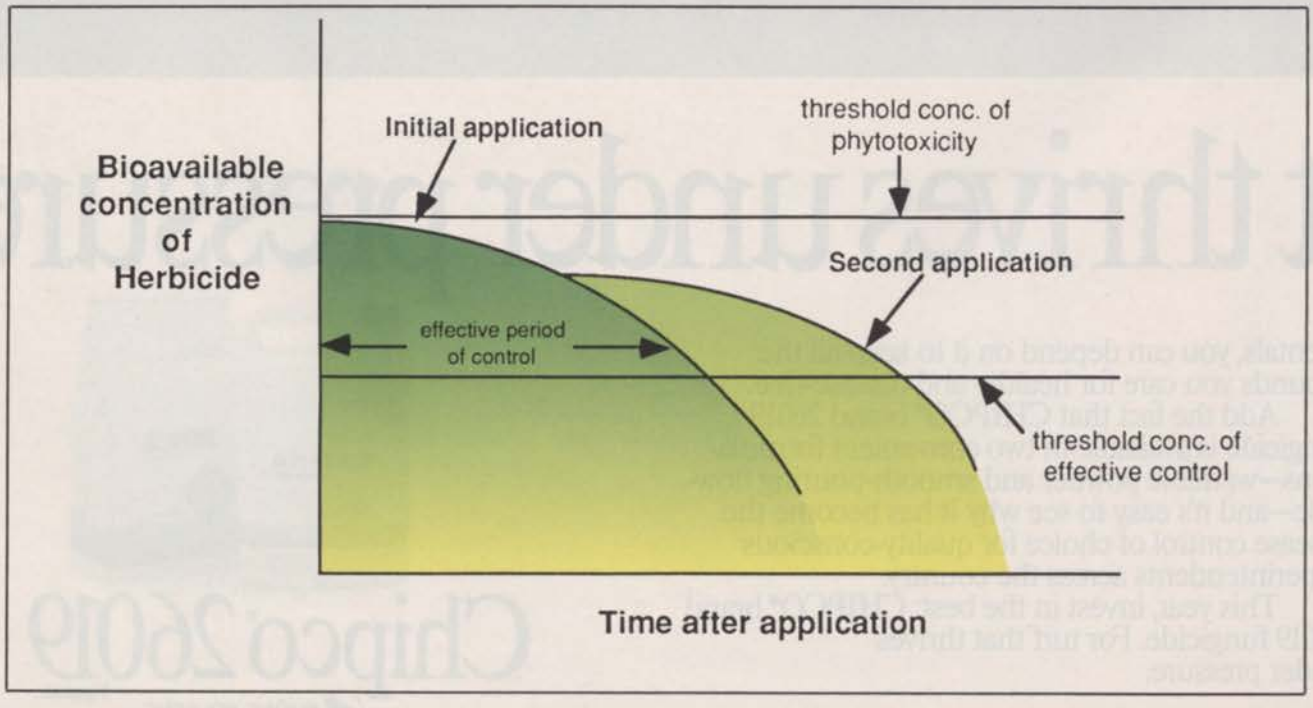
The first step to select an appropriate control strategy for any weed is identifying the weed. Once the troublesome pests have been identified as an annual grass, a corrective strategy can be developed.

The primary causes of open, sparse turf are a limiting nutrient(s) (generally nitrogen) or injury due to stress or pest invasion. Therefore, the first strategy in annual grass management is to increase density by proper fertilization.

Other soil properties, such as pH level, soil compaction, and salt and moisture levels, should also be checked. Soil pH can be corrected by adding sulphur or lime; soil compaction may be alleviated with aeration; and soil moisture can be controlled with proper irrigation and/or drainage.

continued on page 52

Figure 1.



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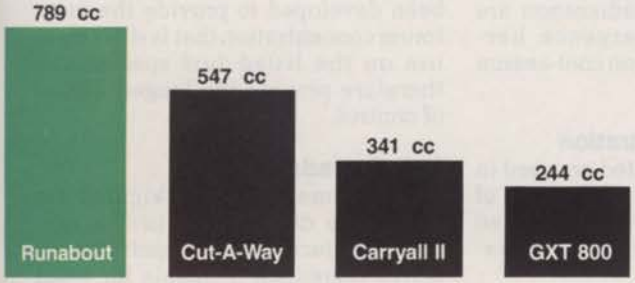

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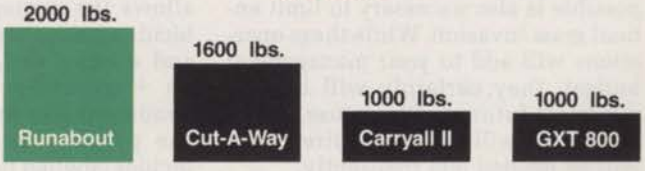

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TABLE 1

HERBICIDES FOR CONTROLLING ANNUAL GRASSY WEEDS IN TURF

Always follow the label directions for application rates and proper timing. For extended preemergent control of annual grass weeds, apply a second application 6 weeks after the initial application at ½ the original rate.

Herbicide	Company	Trade Names & Formulations	Weeds controlled: Annual bluegrass	Weeds controlled: Crabgrass, foxtails, barnyard-grass	Weeds controlled: Goosegrass
benefin	Elanco	Balan 2.5G, 85DG	1s	es	..
	Lesco	2.5 Benefin Granular (2.5G)			
bensulide + oxadiazon	Scotts	Goosegrass/Crabgrass Control	1s	es	..
benefin + trifluralin	Elanco	Team 2G	1s	es	..
bensulide	ICI	Betasan 2.9E, 4E, 3.6G, 7G, 12.5G	1s	es	..
	Royalgard	Roysan 4E, 12.5G			
	PBI/Gordon	Betamec 4LF			
	Lesco	Lescosan 4E, 7G			
DCPA	Fermenta	Dacthal 75W	1s	es	es,ej
ethofumesate	Nor-Am	Prograss 1.5 EC	es,1s	..	..
oxadiazon	Rhone-Poulenc	Ronstar 2G, 50WP	1s	es	es
pendimethalin	Scotts	Turfgrass Weed Control 1.71G	1s	es	..
		Weedgrass Control 60DG			
	Lesco	Pre-M 60DG			
siduron	DuPont	Tupersan 50WP		es	..

es—Apply in early spring before weed emergence. 1s—Late Season

Source: Dr. Fermanian

Repairing pest damage as quickly as possible is also necessary to limit annual grass invasion. While these operations will add to your managemant budget, they certainly will help to minimize future pesticide use. While herbicides will still be required, they will be needed less frequently.

Pre-emergence herbicides

With even the best cultural management, annual grasses sometimes present an aesthetic problem.

The seeds of many annual grass species can be viable for many years in the soil. Any herbicide strategy, therefore, must focus on controlling germinating seeds. Pre-emergence herbicides on the market today generally fit this requirement.

(Table 1 lists currently labelled herbicides targeted for annual grass control in cool-season turfs, along with their manufacturing company, trade name and formulations).

Turf managers have a wide range of herbicides available for pre-emergence control of annual grasses. This allows the manager to select a herbicide appropriate for price, longevity and selected turfgrass species. Benefin + trifluralin, bensulide, dacthal, pendimethalin and oxadiazanon are the primary pre-emergence herbicides labelled for use on cool-season turfs.

Determining concentration

All of the herbicides listed are used in a similar manner. An application of the material is made to the targeted turf prior to the generation of the expected annual grass.

The herbicide must develop a chemical barrier within the upper level of the soil. The germinating seedling will then intercept the pesticide and absorb it through the growing shoot and/or root.

For effective control, the concentration of herbicide must be high enough to stop the growth of the intended weed. This minimum concentration is called the threshold of effective control.

If concentrates are too high, they might possibly cause injury to the desirable turf (called the threshold of phytotoxicity). Labelled rates have been developed to provide the maximum concentration that is still safe to use on the listed turf species and therefore provide the longest period of control.

Soil degradation

All pre-emergence herbicides are subject to degradation in the soil, which reduces the concentration of active ingredient available for weed control.

Materials are added to the soil in a concentration that is higher than the threshold of effective control but lower than the threshold of phytotoxicity.

After application, the concentration in the soil slowly dissipates until the level is no longer above the threshold of effective control. At this time, for extended control, a second

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TABLE 2

PRE-EMERGENCE CONTROL FOR SELECTED BROADLEAF WEEDS

Apply these herbicides prior to weed seed germination. Read and follow label directions for appropriate turfgrass species, timing, and application rates. The following pre-emergence herbicides are commonly used to control annual grasses in turf. They have also been shown to have some control activity on the broadleaf weeds listed.

Herbicide	Weeds Controlled
DCPA (Dacthal)	spotted and prostrate spurge
pendimethalin (LESCO pre-M, Scotts Turf Weedgrass Control)	prostrate spurge, yellow wood sorrel, knotweed, chickweed, henbit
oxadiazon (Ronstar)	yellow woodsorrel

Source: Dr. Fermanian

application is necessary. For extended control in hot, moist seasons, it is useful to apply a second application of herbicide six to eight weeks after the initial application.

Since some herbicide remains in the soil, the second application can be made at a lower rate which will then boost the total concentration above the threshold for effective control.

This dual application is quite necessary for short residual oversight, such as benefin. Additionally, it allows applications to be made at lower rates, which minimizes the risk of exceeding the threshold of phytotoxicity (see Figure 1). It will help provide equally effective periods of control for all herbicides.

A varied arsenal

The major herbicides used to control crabgrass species and other warm-season annual grasses such as foxtail, barnyardgrass, and others are: benefin, benefin + trifluralin, bensulide, dacthal, pendimethalin and oxadiazon. Siduron is used for controlling crabgrass and other annual grasses during the period of seeding and early turf establishment. Siduron is the only preemergence herbicide that is safe to use in seedling cool-season turfs.

Goosegrass is much tougher to control in cool season turfs and requires higher rates for materials such as dacthal and benefin. Excellent goosegrass control can be obtained with oxadiazon with the same rates used to control crabgrass. As always, the label should be consulted for final instructions on the applications of these materials.

An important consideration in the effectiveness of pre-emergence herbicides is the absorption of the materials to clay particles in the soil. A higher clay content will mean greater absorption, leaving less herbicide available for absorption into emerging plants.

Herbicide labels often instruct the user to apply more material in heavy clay soils to compensate for this process. In lighter, sandy soils, it is necessary to reduce the rate of application to minimize the potential for injury to turf.

Second applications, often at reduced rates, are sometimes necessary to provide season-long weed control.

Secondary benefits

Providing control of annual grasses is the primary use of pre-emergence herbicides. A second benefit is the control of annual broadleaf species. This minimizes the need for post-emergence control of broadleaf annual weeds.

(Table 2 shows the annual broadleaf weeds often controlled with pre-emergence annual grass herbicides).

Spotted and prostrate spurge are often difficult to control once well established, but can be controlled with a pre-emergence application of DCPA or pendimethalin.

The annual broadleaf weed yellow wood sorrel or oxalis is also tough to control. Oxadiazon or pendimethalin can help to minimize or eliminate the germination and development of this troublesome weed.

These are just two examples of annual broadleaf control achieved through the use of an annual grass pre-emergence herbicide. The mechanism for control is similar to that for grasses. However, the timing can be considerably different. It is important to apply the materials prior to the earliest germinating species, grass or broadleaf, and, if necessary, insure thorough season-long control with secondary applications.

Annual/perennial control

Gallery (DowElanco) is a herbicide for controlling a larger group of annual and perennial broadleaf weeds. Gallery can be effective in controlling most broadleaf weeds if applied prior to their germination. Consult the Gallery label for the weeds controlled and the optimum application rate.

Appropriate cultural controls and accurate application of pre-emergence herbicides will minimize annual weeds, minimize herbicide requirements and provide an attractive, weed-free turf. **LM**

Dr. Thomas Walter Fermanian is associate professor of turfgrass science at the University of Illinois department of horticulture. He is currently researching qualitative data analysis for agriculture, crop modelling and simulation, and the development of cost effective turfgrass management systems.

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'L' WORDS FACE INDUSTRY IN THE '90s

No one can escape today's onslaught of legislation and litigation in the green industry. But there are ways to sidestep many of the minefields that could land you in court.

by Will Perry, managing editor

Though George Bush was able to use an "L" word successfully in his bid for the presidency in 1988, two other "L" words could pose real problems for the green industry in the 1990s: litigation and legislation.

Americans are playing a "litigation lottery" today, according to attorney Richard Lehr, who represents the Professional Lawn Care Association of America (PLCAA). The skyrocketing number of cases dragged in to American courts can be traced to four developments, says Lehr.

Here comes the judge

First, the green industry is heavily regulated at the local, state, and federal level, as are most businesses where employees drive company vehicles. But the green industry faces additional challenges because its employees drive vehicles *and* use pesticides.

Second, more and more Americans are looking to the courts for vindication. Lehr suggests this may be because there are too many lawyers out there spurring them on. "Our country has many more lawyers than we need," he says. There are more than 40,000 lawyers in Washington D.C., more than 100,000 in California, and more than 35,000 new attorneys churned out of law schools annually. In fact, says Lehr, there is one attorney for every 356 Americans.

Third, consumers and employees are more aware of the statutory and regulatory rights extended to them. "Whether employees know their rights or think they know their rights, they end up in the same place: raising issues before regulatory agencies, government, and the courts," says Lehr.

Lastly, management has a spotty track record of keeping up with current developments and, therefore, often fails to take action to prevent problems from arising.

Landscape managers need to be aware of the changing work force in the 1990s and the effect these changes will have on their management practices (see related story).

There are steps one can take early in the hiring process to avoid age and sex discrimination cases later on, says Lehr.

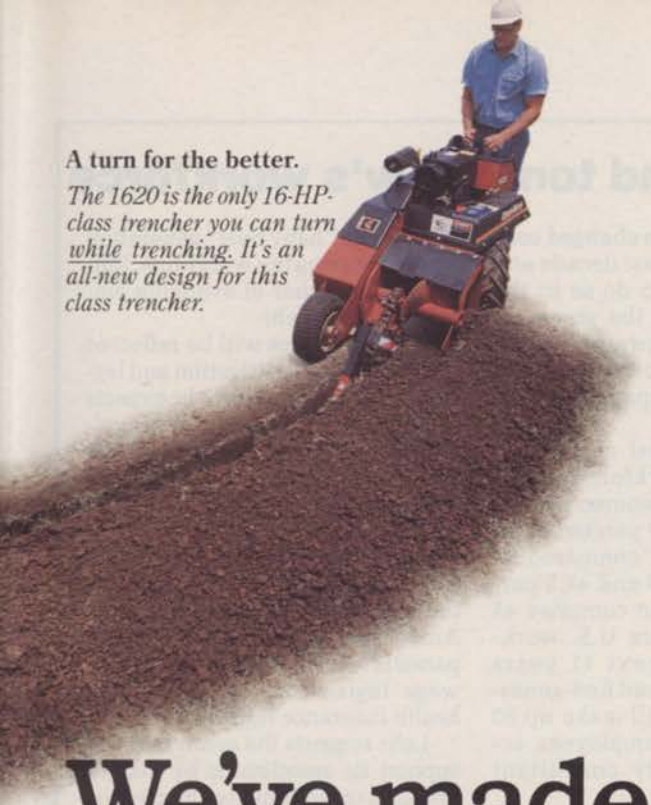
Concerning age discrimination, Lehr suggests you ask direct, job-related questions of all applicants. "If you're concerned about an applicant's physical ability to do the job, consider giving them a 'piece-of-the-job' test," he says. Also, don't assume that a decline in performance is the result of age. More than half are medical related, such as drug or alcohol abuse or some other physical impairment.

The first step toward avoiding sex discrimination is to get rid of any stereotypes you may have that men work in the field and that women work in the office. "Using these generalizations will only lead to liability," warns Lehr. Also, simply because men prefer field work is not a permissible reason not to place a woman in the field.

Equal compensation

Employers must base compensation on factors unrelated to gender. "For example, if a woman is hired to work in the field, and she is married, do not pay her less because she is married," says Lehr. "Do not pay her less because you believe that the men working in the field are the primary breadwinners in their families and therefore should earn more money. Any distinctions in pay must be based on factors other than sex, such as quality of work, quantity of work, length of service, or any other non-sex-based factor."

Lehr says managers can reduce the sex discrimination minefield by avoiding generalizations about height, weight and strength during



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If women performing the same job as men are earning less in your company, re-evaluate the situation or be prepared to state non-sex-based reasons for the difference. Also, train managers and supervisors to comply with the statutes and regulations forbidding sex discrimination and harassment.

Terminating employees

You can fire an employee whenever you want, unless your reasons for doing so violate federal law, public policy, or an employer-created contract, says Lehr.

Employer-created contracts include verbal representations or written communications to applicants or employees, such as handbooks or benefits packages. "Be sure that the employment application and/or employee handbook contain proper disclaimer language," says Lehr.

Consider requiring employees to sign written contracts, adds Lehr. "Such a contract should include a non-compete, confidentiality clause. Also, if you are in a state whose juries tend to be employee-oriented, such as Michigan, New York or California, consider a mandatory arbitration clause for breach-of-contract disputes," he says.

Customer litigation

Often you can tell when a customer is likely to become a future litigant. They're the ones who make repeated sales calls or complaints and/or fail to pay for services because they say they weren't properly performed.

To deal with problem customers, Lehr suggests you train workers to involve management in dealing with these matters as early as possible. If there is a disagreement regarding whether work was performed properly, consider involving a neutral party to analyze the situation and prepare a report. Inform your attorney and insurance agent of a potential claim, and consider the use of arbitration as a dispute resolution procedure before litigation, says Lehr.

Legal discipline

Discipline is an essential management resource, but discipline poorly administered can lead to litigation. Proper discipline involves five steps:

Step 1. Be sure the employee understands what is expected of them and that they are capable of performing as expected.

Step 2. If the employee does not perform as expected, ask the employess to explain their actions and determine whether the problem was due to teaching or "won't do" or "can't do" by the employee, says Lehr. Explain what the employee needs to do, be sure they know how to do it, and follow up your actions with a memo to the employee which you review together.

Step 3. If the problem continues, repeat Step 2, emphasizing the importance of performing as expected and the implications for failing to do so.

Step 4. Again repeat Step 2, this time explaining that failure to alter behavior may result in termination.

Step 5. "De-hire," says Lehr. "The employee, through his or her behavior, has said that they do not want to work for your company."

Document your actions

Documentation insures there is no misunderstanding and that you acted fairly. The document should include the date of preparation, a summary of the incident and previous discipline, and action required. A supervisor should sign the document and a copy should be given to the employee. The employee should be offered an opportunity to respond if they disagree, adds Lehr, but it should be written on a separate document.

During the "de-hiring", make sure you state your case, ask the employee if he believes he has been treated fairly, review the type of reference the company will provide, review confidentiality, and prepare a summary of the meeting immediately after.

Lehr adds that association support, financial commitment for activities intended to influence the legislative or regulatory process, and practicing problem prevention can help minimize the effect of the "L" words on the green industry in the 1990s.

"An aggressive reaction to hearings about proposed legislation or regulations will not hurt you," says Lehr. "A delayed reaction will not help you." **LM**

Richard I. Lehr is a partner in the law firm of Sirote, Permutt and chairman of the firm's Labor and Employment Department. He is PLCAA's general counsel and spoke at the association's Tenth Anniversray Conference in November 1989.

Understand tomorrow's workforce

America's workforce changed considerably over the past decade and and will continue to do so in the 1990s. Managers in the green industry need to be aware of these changes in order to comprehend the direction and impact of impending legislation.

Perhaps the most significant change in the workforce is the growing number of women participants. More than 60 percent of all U.S. women work, compared to 54.3 percent in 1980 and 47.3 percent in 1975. Women comprise 45 percent of the entire U.S. workforce. Over the next 11 years women, minorities and first-generation immigrants will make up 80 percent of all new employees, according to industry consultant Richard Lehr.

Fewer workers, income

Another significant change is the age of the American worker. Employees are retiring earlier. Jobs paying $20,000 a year or more have declined while the number of temporary and part-time jobs has increased (60 percent of which paid less than $7,000 annually in the 1980s). The "baby bust" generation is now entering the workforce, limiting the number of available employees, says Lehr.

These changes will be reflected in the "L" words: litigation and legislation. For example, Lehr expects a rise in the number of cases involving age and sex discrimination, breach of employment contracts and consumer litigation.

Impending legislation

Concerning upcoming legislation, the agenda in 1990 will feature the Americans With Disabilities Act, parental leave legislation, minimum wage legislation, and mandated health insurance legislation.

Lehr suggests the green industry support its associations by making financial commitments for activities intended to influence the regulatory and legislative process. "Making contributions to certain candidates enhances your opportunity to influence the processes," says Lehr.

Also, practice problem prevention in your business and react aggressively to proposed hearings or legislation.

—Will Perry□

EARLY-SEASON FERTILIZATION

Applying the right fertilizer at the right rate and at the right time is an important step toward growing high quality turf.

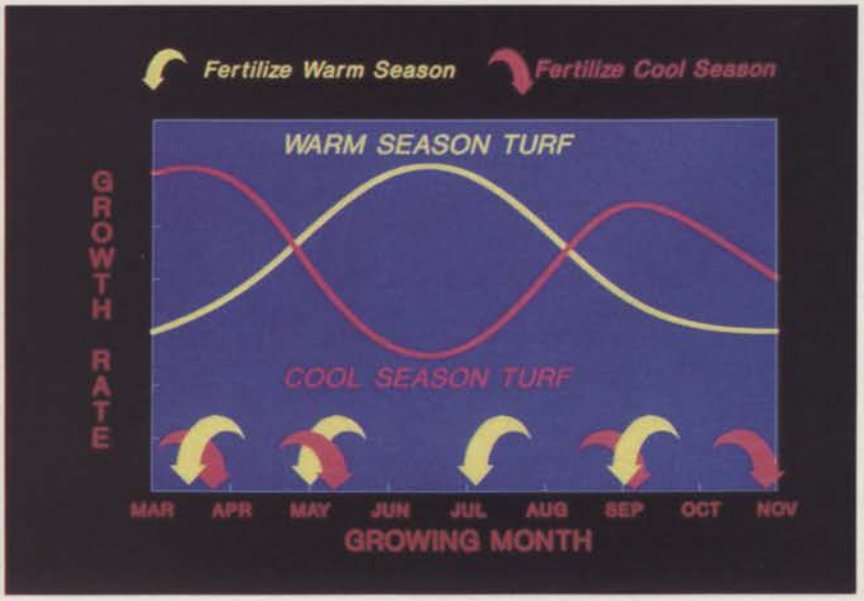
by Roch E. Gaussoin, Ph.D., Kansas State University

To get a high quality turfgrass stand, you need to conscientiously and judiciously implement a number of management factors. Fertilization, one cultural practice, involves several considerations. If it is properly addressed, it can help you maintain quality turfgrass.

Correct choice of fertilizer carrier, laboratory soil analysis to determine fertility needs, and equipment calibration—all need to be completed before the growing season as they are vital to success.

Fertilizer that is poorly applied can result in lost revenue from call-backs or turf loss. Therefore, application equipment should be calibrated regularly.

FIGURE 1.



Nutritional needs

Nutrients required for turfgrass plant growth are divided into two general categories. Nitrogen, phosphorous, potassium, magnesium, sulfur and calcium, required by turfgrass in relatively large quantities, are called macronutrients. Iron, boron, manganese, copper, zinc, chlorine and molybdenum, needed in relatively small amounts, are termed micronutrients.

Supplemental application of magnesium and calcium, as well as boron, manganese, copper and chlorine is not usually necessary because these elements are in abundant supply in the growing environment. So are carbon, hydrogen and oxygen, which also are required for turfgrass growth.

The primary nutrients the turfgrass manager is concerned with are nitrogen, potassium and phosphorous. These elements are used by the growing turf in large quantities and must be replaced in the soil via fertilizers to insure healthy green growth.

In some instances sulfur, iron and zinc may also require supplemental application.

The turf manager's decision of the

product to use depends on the turf's nutritional needs. These needs are best determined by soil testing at a reputable soil testing laboratory.

Most state universities have a soil testing facility. Cost is relatively inexpensive. Commercial testing laboratories are also available. Check with your local county extension office for the availability and cost to analyze your soil samples.

Follow guidelines

Many testing laboratories will provide sample containers as well as guidelines for proper sample collection. Follow these guidelines explicitly; test results can be no better than the sample collected in the field.

A basic fertility test will include pH, available phosphorous and exchangeable potassium. Because nitrogen is very transient in the soil and a sound fertility program will include nitrogen application, nitrogen analysis is not required or recommended. The basic fertility test will, however, indicate the need for supplemental phosphorous or potassium.

In certain regions of the country, especially the western U.S., a soluble salts test is also recommended.

Nitrogen sources

A myriad of nitrogen sources are available on the market, each with characteristics that influence their adaptability to a turf care operation.

Nitrogen sources can be categorized as "slow" or "quick" release, depending on the speed of release in the carrier and its availability for plant growth.

Release of nitrogen from fertilizers is by chemical or biological means, depending on the nitrogen source. Urea, ammonium nitrate and ammonium sulfate are very water soluble and quickly dissolve after a rainfall or when irrigated. Other carriers, such as ureaformaldehyde or natural organic fertilizers, require microbial activity for nutrient release.

Conditions which favor microbial activity with these types of fertilizers, such as moist soil and warm temperatures, also hasten nitrogen availability.

The nitrogen in IBDU becomes available as the product is hydrolyzed, so release depends on soil moisture, as well as fertilizer particle size. Another important facet of nitrogen sources is the salt index, which indicates the burn potential of a particular fertilizer. The higher the index, the greater the potential for fertilizer burn.

Carriers which have a high salt index per unit of N should not be used when conditions are favorable for burn (such as high temperatures and low soil moisture). A summary of some common nitrogen sources and their characteristics is shown in Table 1.

TABLE 1.

N SOURCE CHARACTERISTICS

N-SOURCE	SALT INDEX	RESIDUAL (WEEKS)
QUICK RELEASE		
Urea	1.62	4-6
Ammonium Nitrate	3.18	4-6
Ammonium Sulfate	3.25	4-6
SLOW RELEASE		
IBDU	0.20	6-8
Methylene Urea	0.86	6-8
Ureaformaldehyde	0.20	52+
Sulfur Coated Urea	0.70	Varies
Natural Organics	0.70	Varies

TABLE 2.

MONTHLY N REQUIREMENTS FOR DIFFERENT COOL SEASON TURFGRASS SPECIES AT TWO MANAGEMENT LEVELS

	LBS N/GROWING MONTH/1000 SQ FEET Management Level	
	LOW	MED-HIGH
Chewings Fescue	0.2-0.3	0.4-0.6
Red Fescue	0.2-0.3	0.4-0.6
Italian Ryegrass	0.3-0.4	0.5-0.6
Common Ken. Bluegrass	0.3-0.4	0.5-0.6
Perennial Ryegrass	0.3-0.4	0.5-0.6
Tall Fescue	0.3-0.4	0.6-0.7
Kentucky Bluegrass	0.4-0.5	0.6-0.7
Creeping Bentgrass	0.4-0.5	0.6-0.7

Within each range higher N level should be used if clippings are removed, if soil is sandy and if turf is irrigated frequently or grown in a high rainfall area.

Application timing

Differences in geographic location, soils, climate and species will strongly influence application timing. These general recommendations for timing and rates should only be used as a guideline, making adjustments as necessary.

Application timing is strongly influenced by turfgrass species. Warm-season turfs, like bermudagrass and zoysiagrass, are fertilized at a different time of year than cool-season turfs like tall fescue and Kentucky bluegrass.

This timing difference is closely related to when these turfs are actively growing. Warm-season turfs go off-color in the fall and, depending on location, will not green-up in the spring until as late as April or May. Cool-season turfs, on the other hand, grow actively in the spring and fall, but growth is minimal in the late summer months.

Cool vs. warm

In general, fertilizer is applied to an actively growing turf. There are, however, exceptions to this guideline. Cool-season turfs should be fertilized in the late fall, after the last mowing of the season.

University research and practical experience has shown that cool-season turf fertilized in the late fall has better root growth, fewer weeds, disease and thatch, longer fall color, and earlier spring green-up than turf fertilized in the spring.

A strong disadvantage to spring fertilization is a flush of top growth at the expense of root growth prior to the

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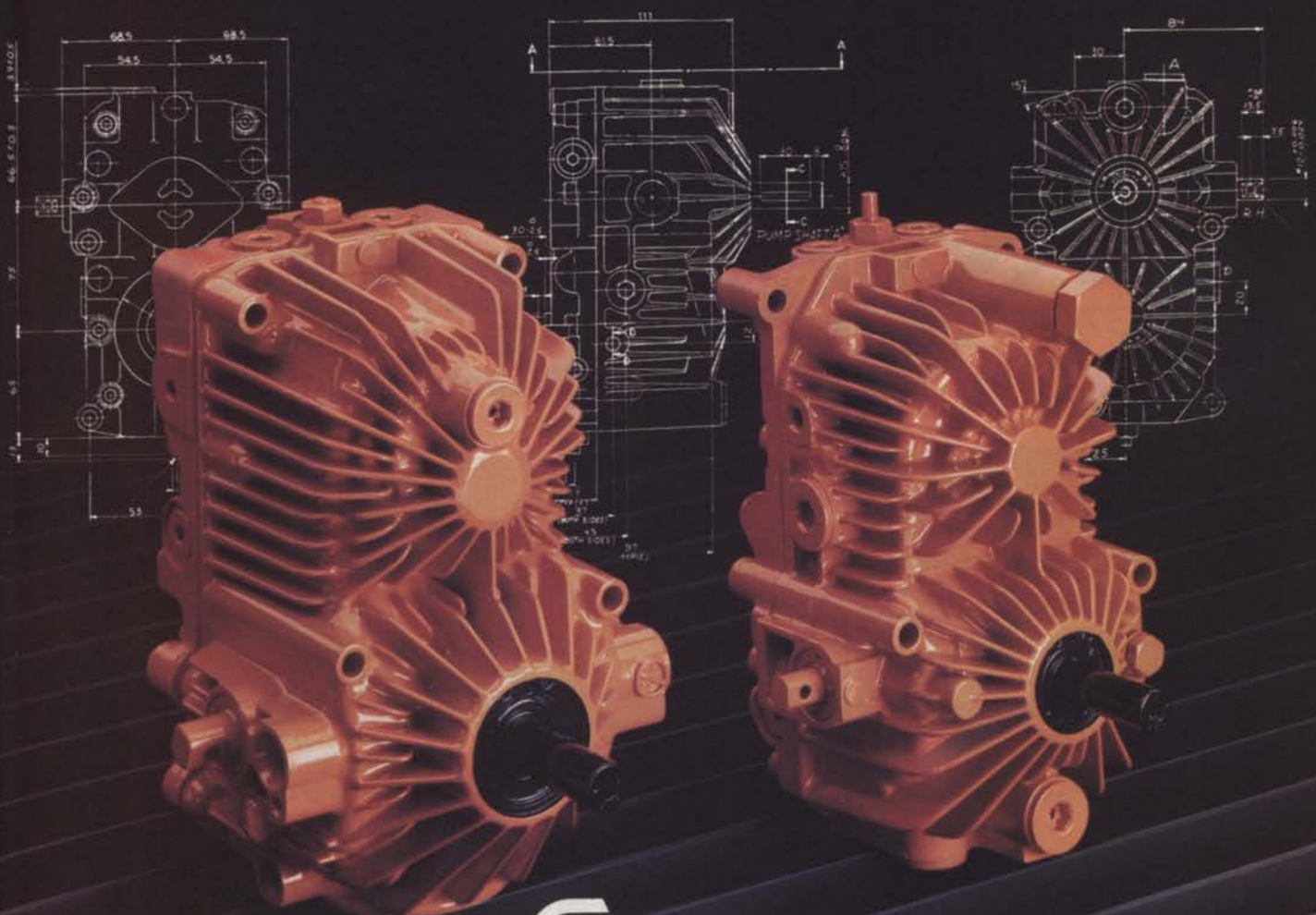

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TABLE 3.

MONTHLY N REQUIREMENTS FOR DIFFERENT WARM SEASON TURFGRASS SPECIES AT TWO MANAGEMENT LEVELS

	LBS N/GROWING MONTH/1000 SQ FEET Management Level	
	LOW	MED-HIGH
Buffalograss	0.0-0.1	0.2-0.4
Bahiagrass	0.0-0.1	0.2-0.4
Centipedegrass	0.0-0.1	0.2-0.4
Carpetgrass	0.2-0.3	0.4-0.6
St. Augustinegrass	0.3-0.4	0.5-0.7
Zoysiagrass	0.3-0.4	0.5-0.7
Bermudagrass	0.4-0.5	0.5-0.7

Within each range higher N level should be used if clippings are removed. If soil is sandy and if turf is irrigated frequently or grown in a high rainfall area.

Source: Dr. Gaussoin

summer stress period. For this reason, spring fertilization of cool-season grasses is not recommended.

If a spring fertilization is applied for client or owner satisfaction, the rate should not exceed more than ½ lb. N/1000 sq.ft. (see Table 2).

Warm-season grass fertility programs should be started in the early spring, as the turf becomes active, and continue through the active growing season.

Over-stimulation of warm-season grasses in late fall should be avoided because succulent growth may be more susceptible to frost damage or winterkill (see Table 3). A general growth cycle and fertility schedule for warm- and cool-season turfs is shown in Figure 1.

Adjustments for geographic location and attention to previously discussed timing exceptions should be considered before planning application timing.

Proper rates

Application rates of nitrogen fertilizers depend on species, as well as the level of maintenance desired. Turf that is well fertilized will require more frequent mowing and irrigation, but it will be of higher quality.

Management practices will also influence fertility rate. For example, if clippings are removed, higher rates of fertilizer need to be applied to compensate for the loss of nutrients in the removed clippings. Additionally, if the turf is irrigated frequently or grown on sandy soils or in a high rainfall region, higher nitrogen levels should be used (see TABLE 2 for monthly nitrogen requirements for most turfgrass species). **LM**

Dr. Gaussoin is an assistant professor of horticulture at Kansas State University.

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Early-blooming bulbs grow well at the base of trees, along parking lots and near building entrances, as demonstrated here in Colonial Williamsburg.

SHOUT 'SPRING!' WITH COLORFUL BULBS

Myriad bulb varieties will turn up the color volume on spring landscaping displays.

by Ann Reilly

The saying that good things come in small packages certainly is true where spring-flowering bulbs are concerned. These self-contained packages of foliage and flowers will welcome spring with vivid colors year after year.

The bulbs, triggered into motion by time and/or temperature, are very reliable plants. They're the first to arrive in spring and make a visual impact that is difficult surpass the rest of the season.

Although only some plants, such as daffodils and hyacinths, are actually true bulbs, there are other plants that grow in a similar manner and are called "bulbs," even though they are technically corms, rhizomes or tubers. These plants are grouped together under the heading of "spring bulbs" because they are all planted in fall when they are dormant and grow and flower the following spring. Once flowering is complete, the foliage manufactures food, stores it in the bulb for the following year and dies down.

Bulbs in the landscape

Nothing shouts "spring" louder than a magnificent bulb display, especially one tastefully integrated into the landscape. Long before any color is contributed to the garden by any other plant, bulbs, such as winter aconite, snowdrops, bulbous iris, early-blooming species crocus and the later-blooming hybrid crocus, are poking their heads through the ground, leaves and even snow.

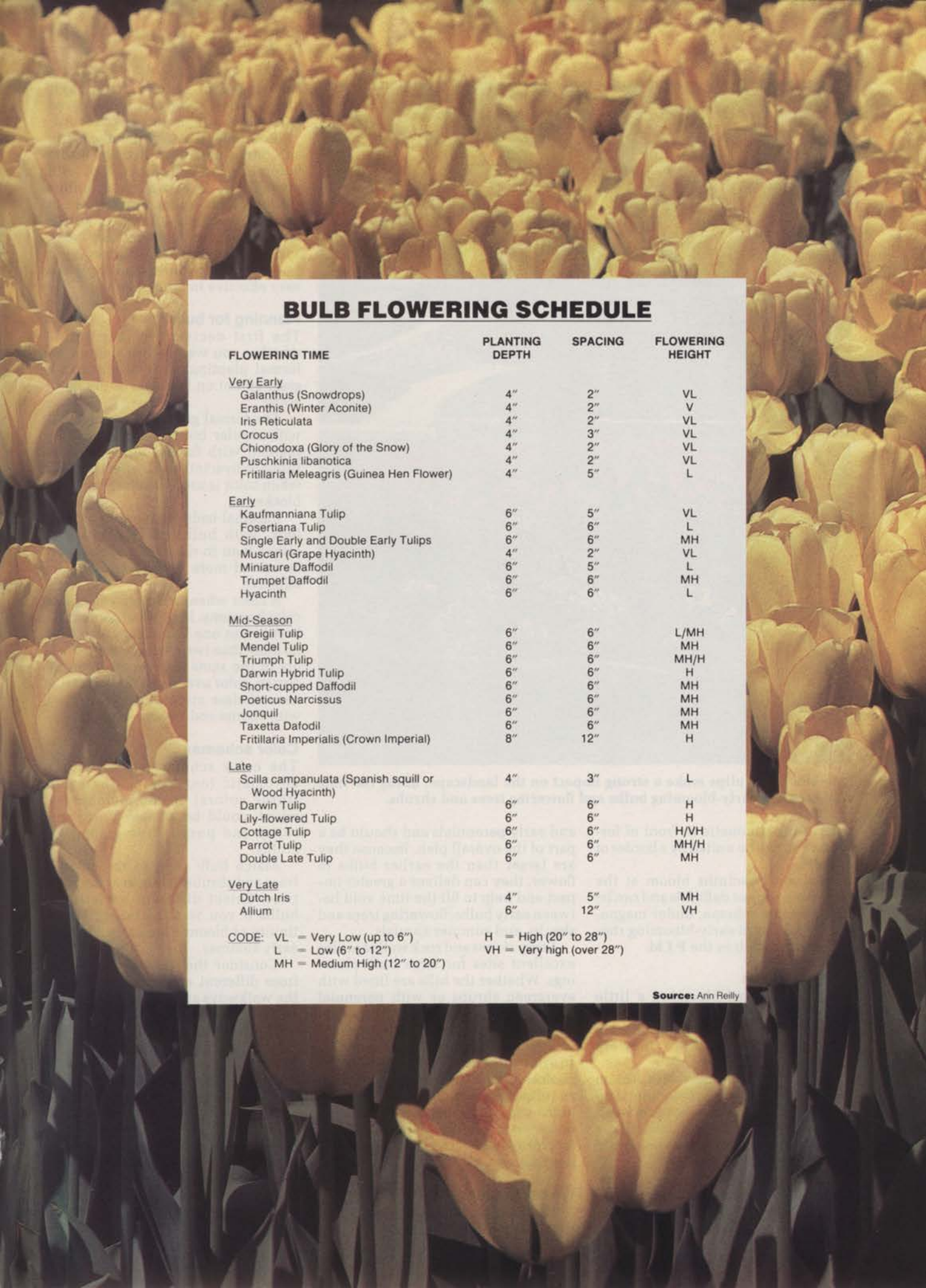
Smaller bulbs are the earliest to bloom and therefore should be set where they will be noticed up close. Besides growing in the lawn, they grow well at the base of trees, along the edges of parking lots, near building entrances—wherever they will be in view of public places.

A little later, Grecian Windflower, Siberian Squill, Glory of the Snow and Puschkinia bloom when days are still bleak and trees and shrubs are just beginning to bloom or leaf out.

Early bulbs

All of these early bulbs can also be naturalized into the lawn, as it has not yet started to grow.

Early tulips and daffodils form an

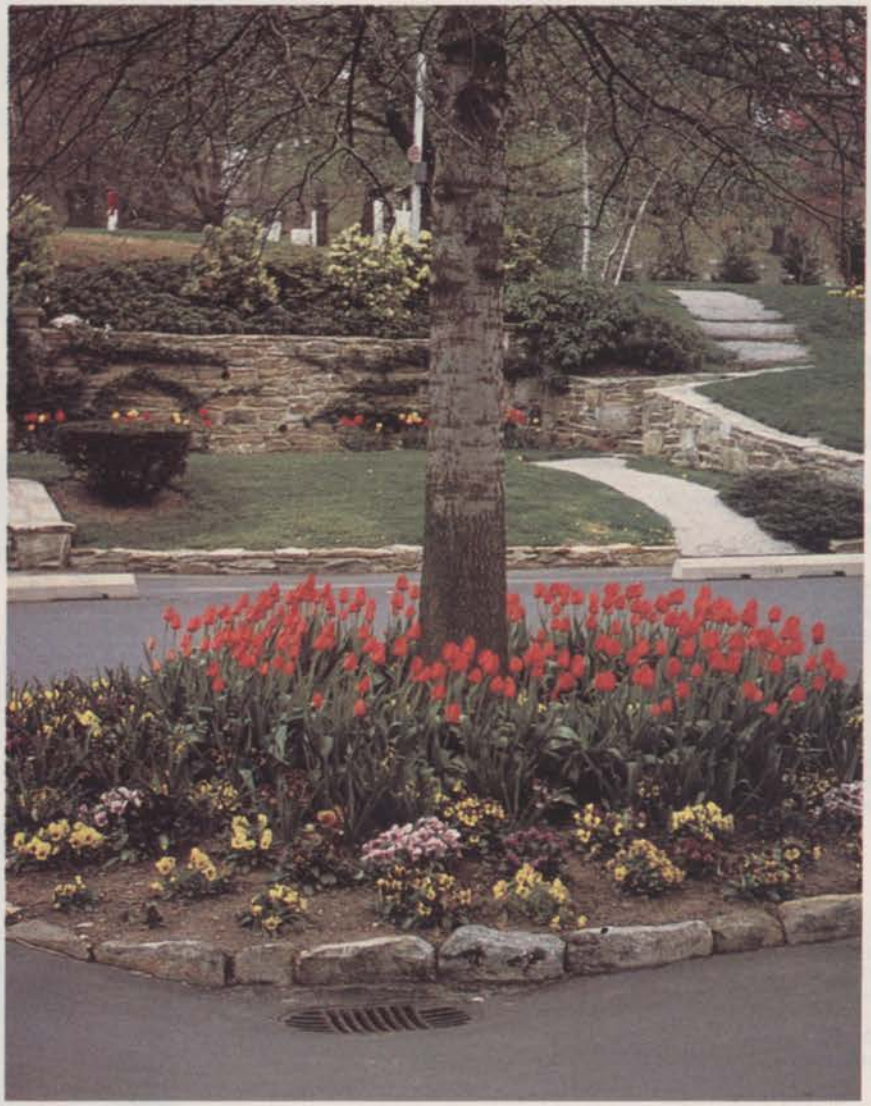


BULB FLOWERING SCHEDULE

FLOWERING TIME	PLANTING DEPTH	SPACING	FLOWERING HEIGHT
Very Early			
Galanthus (Snowdrops)	4″	2″	VL
Eranthis (Winter Aconite)	4″	2″	V
Iris Reticulata	4″	2″	VL
Crocus	4″	3″	VL
Chionodoxa (Glory of the Snow)	4″	2″	VL
Puschkinia libanotica	4″	2″	VL
Fritillaria Meleagris (Guinea Hen Flower)	4″	5″	L
Early			
Kaufmanniana Tulip	6″	5″	VL
Fosertiana Tulip	6″	6″	L
Single Early and Double Early Tulips	6″	6″	MH
Muscari (Grape Hyacinth)	4″	2″	VL
Miniature Daffodil	6″	5″	L
Trumpet Daffodil	6″	6″	MH
Hyacinth	6″	6″	L
Mid-Season			
Greigii Tulip	6″	6″	L/MH
Mendel Tulip	6″	6″	MH
Triumph Tulip	6″	6″	MH/H
Darwin Hybrid Tulip	6″	6″	H
Short-cupped Daffodil	6″	6″	MH
Poeticus Narcissus	6″	6″	MH
Jonquil	6″	6″	MH
Taxetta Dafodil	6″	6″	MH
Fritillaria Imperialis (Crown Imperial)	8″	12″	H
Late			
Scilla campanulata (Spanish squill or Wood Hyacinth)	4″	3″	L
Darwin Tulip	6″	6″	H
Lily-flowered Tulip	6″	6″	H
Cottage Tulip	6″	6″	H/VH
Parrot Tulip	6″	6″	MH/H
Double Late Tulip	6″	6″	MH
Very Late			
Dutch Iris	4″	5″	MH
Allium	6″	12″	VH

CODE: VL = Very Low (up to 6″)
L = Low (6″ to 12″)
MH = Medium High (12″ to 20″)
H = High (20″ to 28″)
VH = Very high (over 28″)

Source: Ann Reilly



Late-blooming tulips make a strong impact on the landscape, filling the time void between early-blooming bulbs and flowering trees and shrubs.

enchanting silhouette in front of forsythia and can be united by a border of pansies.

Fragrant hyacinths bloom at the same time as most daffodils and can be added to this scheme, under magnolias or in front of early-blooming rhododendrons such as the P.J.M.

Late bloomers

Grape hyacinths, blooming a little later, add complementary blue to the pinks of flowering crabapples, cherry and peach; with red tulips, they are dazzling.

With late-blooming azaleas, Scotch broom and dogwood, combine late-blooming tulips, Dutch iris and wood hyacinth. Allium can add color and a unique accent to early perennials and tie the two seasons together.

Late-blooming tulips, hyacinths, daffodils and the more unique summer snowflake, crown imperial and allium, bloom with late-spring shrubs and early perennials and should be a part of the overall plan. Because they are larger than the earlier bulbs to flower, they can deliver a greater impact and help to fill the time void between early bulbs, flowering trees and shrubs, and summer annuals.

Steep slopes and rock walls are also excellent sites for large bulb plantings. Whether the hills are lined with evergreen shrubs or with perennial ground covers, bulbs can transform them into a kaleidoscope of color.

Informal bulbs such as daffodils, squills and anemones are better choices here than formal bulbs such as tulips and hyacinths. These same bulbs and others, such as guinea hen flower or star-of-Bethlehem, are perfect for naturalistic, rustic, or woodsy landscapes.

Where to plant

Tulips and hyacinths are most effective planted in formal masses in the flower bed or border. After their bloom fades, color can be achieved with annuals in the same spot.

Most bulbs like to be planted in full sun, but since most of them bloom before the trees leaf out, they will probably be in sun anyway, unless shaded by a building. Bulbs grown in shadier situations will bloom a little later, will have more intense color, and have longer lasting flowers.

Geometric patterns and logos are very effective in bulb plantings.

Planning for bulbs

The first decision to be made is whether you want a formal or an informal planting. This depends to a great extent on the style of the landscape.

The formal garden is symmetrical with regular borders and should be planted with formal bulbs such as tulips or hyacinths. It is effective only when color is used in mass or in large blocks.

Informal beds are more natural in look, with bulbs planted in drifts rather than in rigid lines. Colors can be mixed more heavily and still be effective.

A color wheel will help you create color harmony. In a formal garden it is best to use one dominant color with no more than two complementary colors in the same area. In an informal design, color use can be freer, but it is nevertheless more effective if used with rhyme and reason.

Color schemes

The color scheme can be monochromatic (one color), analogous (three colors) or complementary, which could be achieved with red tulips and purple-blue grape hyacinths.

Match bulb color to the color of trees and shrubs in bloom at the same time. Select different varieties of bulbs if you want to insure a continuity of bloom from early spring to early summer.

Consider the view of the design from different angles: the approach, the walkways and the outside as well as from inside the buildings. Raised beds can add drama to a view while correcting poorly drained soil.

Plan to plant the bulbs in groups. In formal designs, these groups will naturally be large. Even in informal designs, plant in clumps of three to 12, depending on the size of the plant. It's far better to plant three groups with four tulips in each one than to line a dozen tulips in a straight line in front of a hedge. For best visual effect, there should be only one color in each clump.

continued on page 80

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Bulbs *from page 78*

When bulbs are used in a naturalized setting, select a spot where they will not have to be disturbed until their foliage dies away.

Privacy desired

When bulbs are interplanted with groundcovers or existing plants, it is possible that nothing further will need to be done with the area after the bulbs fade. In large beds and borders, add annuals as soon as they can be planted in the spring. Where perennials and bulbs are used together, try to plant and divide both at the same time. That way you know where everything is.

Geometric patterns and logos are very effective in bulb plantings. Depending on the time of year you are looking for the bloom to occur, choose among more formal bulbs like hybrid crocus, hyacinths, grape hyacinths and tulips for this type of bulb planting. They can be sketched out on graph paper in advance, and the same plan can be used to replant the area with annuals if you desire.

Planting bulbs

If you want top quality flowers, you must plant top-quality bulbs. Don't try to skimp: you and your customer will only be disappointed at the small flowers and the poor performance. Purchase large, firm bulbs that do not have visible scars, bruises or soft spots.

Until you plant your bulbs, be sure to store them in a dark, dry and cool area so they will not rot, grow or dry up. A covered box inside an unheated maintenance building or garage is an ideal location.

You can plant spring bulbs any time in the fall until the ground freezes. If you can't plant all of them at once, start with the smaller, earlier-flowering bulbs and end with the tulips.

Because bulb roots reach deep, deep soil penetration is critical. Plow, spade, or double dig to a depth of 12 inches for the largest bulbs, six inches for the smaller ones. Drainage and aeration are especially critical for bulbs to prevent rotting over winter. Add organic matter to equal 25 percent of the soil volume to insure correct soil consistency.

Planting large areas

It is easiest to plant large areas by digging out the entire bed to the proper depth, placing the bulbs in place, and replacing the soil. Note the planting depth of the bulb, or plant to a depth of 2½ to 3 times the bulbs' width.

In formal plantings, set out at least three rows of bulbs in straight lines. In informal designs, stagger the bulbs so they look natural. One good way to do this is to lightly toss them on the ground and plant them where they fall.

When planting, add superphosphate or bone meal to the soil in the bottom of the planting hole, and place the bulb on top of it. This will assure good root growth.

Keep animals away

If squirrels, chipmunks, or other small animals are a nuisance, place the bulbs in a wire basket and plant the basket, or place a layer of chicken wire over planting beds. Secure its corners to prevent it from being dug up.

Squirrels will eat the flowers of many hybrid tulips. If you have squirrels and cannot eliminate them by trapping, you may want to choose another bulb. There really isn't much you can do about it. Dusting bulbs with Thiram before planting offers temporary relief. Dried blood was once highly recommended, but its effectiveness washes away with irrigation or rain. Repellants have some effectiveness.

After planting...

After planting, water well once, which should be sufficient until growth starts in the spring. Mulch with oak leaves, bark chips or other organic mulch, which will protect small bulbs from being heaved from the ground in winter.

Spring-flowering bulbs are small packages with big color impact. Plant some this fall. Although you won't be rewarded for many months, the impact on the landscape will be worth the wait. **LM**

Caring for bulbs is easy

Care for bulbs is minimal. A few simple tips will keep them at their blooming best.

Since bulbs manufacture and store food each year, feeding them is essential. An all-purpose fertilizer high in phosphorus added as growth begins or as the foliage begins to fade is best.

When large bulbs (tulips, daffodils, hyacinths) have bloomed, cut the flowers off immediately so they don't set seed. That way they direct their energy into the bulb for the following year. Smaller bulbs can be let go to seed, which will scatter and increase the colony.

Keep foliage

Never remove the foliage until it has turned brown. Bulbs planted in a grassy area should be early-blooming types so the browning of the foliage doesn't interfere with mowing the grass.

The foliage of most bulbs is gone within a month after blooming. The foliage of daffodils however, hangs around for six to eight weeks, which can cause problems. In planting beds, the foliage can be braided or folded out of the way.

Smaller is simpler

Many of the smaller bulbs need no further attention after they are planted. They will naturally increase and form large groups. Daffodils and crocus need dividing every four to six years, when the flowers decrease in size and the planting becomes crowded. The best time to do this is in the spring right after the foliage fades.

Tulips and hyacinth bulbs do not increase in most parts of the United States, and diminish in size each year. They will therefore need to be replaced quite often.

Some installations plant new tulips every year, cutting the foliage back as soon as it fades. The bulbs can be removed, but it's not necessary. Whether or not you do this or try to get several years out of tulips depends on your budget.

No pests, please

Bulbs develop few insect or disease problems. Virus diseases cause flowers to become misshapen or discolored. Since they cannot be cured, the only recourse is to dig up and discard the bulb.

Instant effect in small areas can be achieved by purchasing pots of forced bulbs, or forcing your own if you have a greenhouse facility. This is more expensive and time consuming, and the bulbs in most cases cannot be reused. □

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Everett Mealman
President
PBI/Gordon Corporation

"Sometimes things are so obvious that they take you by surprise." No, that's not Yogi Berra double talk . . . It's the essence of what so many of our turf friends said when they sampled Trimec Plus last year.

Listen to Sandy Queen, Certified Superintendent of Golf for the city of Overland Park, Kansas. "The minute I read the Trimec Plus label, I said to myself, Hey, this will work! I just know it will!"

It was in August of 1988 when Sandy saw the Trimec Plus label and the first thought that came to his mind was to test it against a $250.00-a-gallon post-emerge he had already purchased to use on the goosegrass of a newly seeded driving-range tee at the Overland Park Golf Course.

"You remember the weather last year," said Sandy, "so you won't be surprised to learn that, even though a pre-emergent had been used, the tee was loaded with goosegrass and crabgrass. We sprayed half of it with the super expensive exotic and the other half with Trimec Plus, which I believe costs $27 a gallon and, based on the rates we used, cut our cost per acre in half.

"The super expensive exotic only got the young goosegrass. It did virtually nothing on the mature plants. But that one application of Trimec Plus virtually cleaned out all the grassy weeds as well as a good deal of yellow nutsedge that was also immune to the more costly treatment."

We'll tell you what Sandy Queen saw on the Trimec Plus label that made him so sure it was a winner, but first, here are a few more comments from your peers.

Works with no burning or discoloration

Russell Kestler, who owns Rus-

Below is a polaroid showing the goosegrass control of brand A, vs. Trimec Plus. At left in photo is August Leitzen, Superintendent of Overland Park Golf Course, with Sandy Queen, Certified Superintendent of Golf for the city of Overland Park, Kansas.

1) Tom Tomlinson, left, of Lawn Doctor in Trumbull, West Redding, Connecticut with two of his drivers, Gary Schwarz (center) and Matt Werthmann. Tomlinson reports excellent results with Trimec Plus on yellow nutsedge.

2) Russell Kestler, of Russell's Landscaping, Malverne, N.Y. Kestler used Trimec Plus to control crabgrass in 85° temperature with very good results and no burning or discoloration.

sell's Landscaping of Malverne, New York out on Long Island, said, "We used Trimec Plus last season on approximately 140,000 sq. ft. of residential turf that was loaded with crabgrass. We got excellent results with just one application — and there was no discoloration or burning of the turf, even in August."

Tom Tomlinson of Lawn Doctor in West Redding, Connecticut used it on over 40 lawns last year to clean out yellow nutsedge and crabgrass. "The results were excellent," said Tomlinson. "Trimec Plus totally cleaned up an unusually heavy infestation of nutsedge and crabgrass in spite of erratic and difficult weather conditions, and in most instances only one treatment was needed.

"And guess what," continued Tomlinson. "Trimec Plus also cleaned up our clover problems."

After listening to Tomlinson, we almost think we should have named our new herbicide Trimec Plus-Plus-Plus: nutsedge *plus* crabgrass, *plus* broadleaves, *plus* economy.

Why Trimec Plus is so efficient

Now, back to what Sandy saw on the Trimec Plus label that got his enthusiasm up — it was MSMA as an ingredient in a new Trimec Complex. As a Certified Superintendent of Golf, Queen is quite naturally a dyed-in-the-wool user of Trimec and, of course, he has had extensive experience with MSMA.

He knows that MSMA is surely one of the most effective herbicides for use on grassy weeds and sedges, but that it has a major flaw. To get enough of it into a grassy weed to kill it requires repeated applications, or so much of a wetting-and-penetrating agent that burning and discoloration will occur.

And he also knows that Trimec has a unique eutectic characteristic that gives it unparalleled penetrating power.

A new Trimec Complex

So, when MSMA is locked into a Complex with Trimec — which is precisely what Trimec Plus is — you have a superior system for delivering the MSMA to grassy weeds such as crabgrass, dallisgrass, barnyardgrass and nutsedge — and, of course, the delivery system itself, Trimec, is the undisputed number one post-emergent broadleaf herbicide for ornamental turf in all the world!

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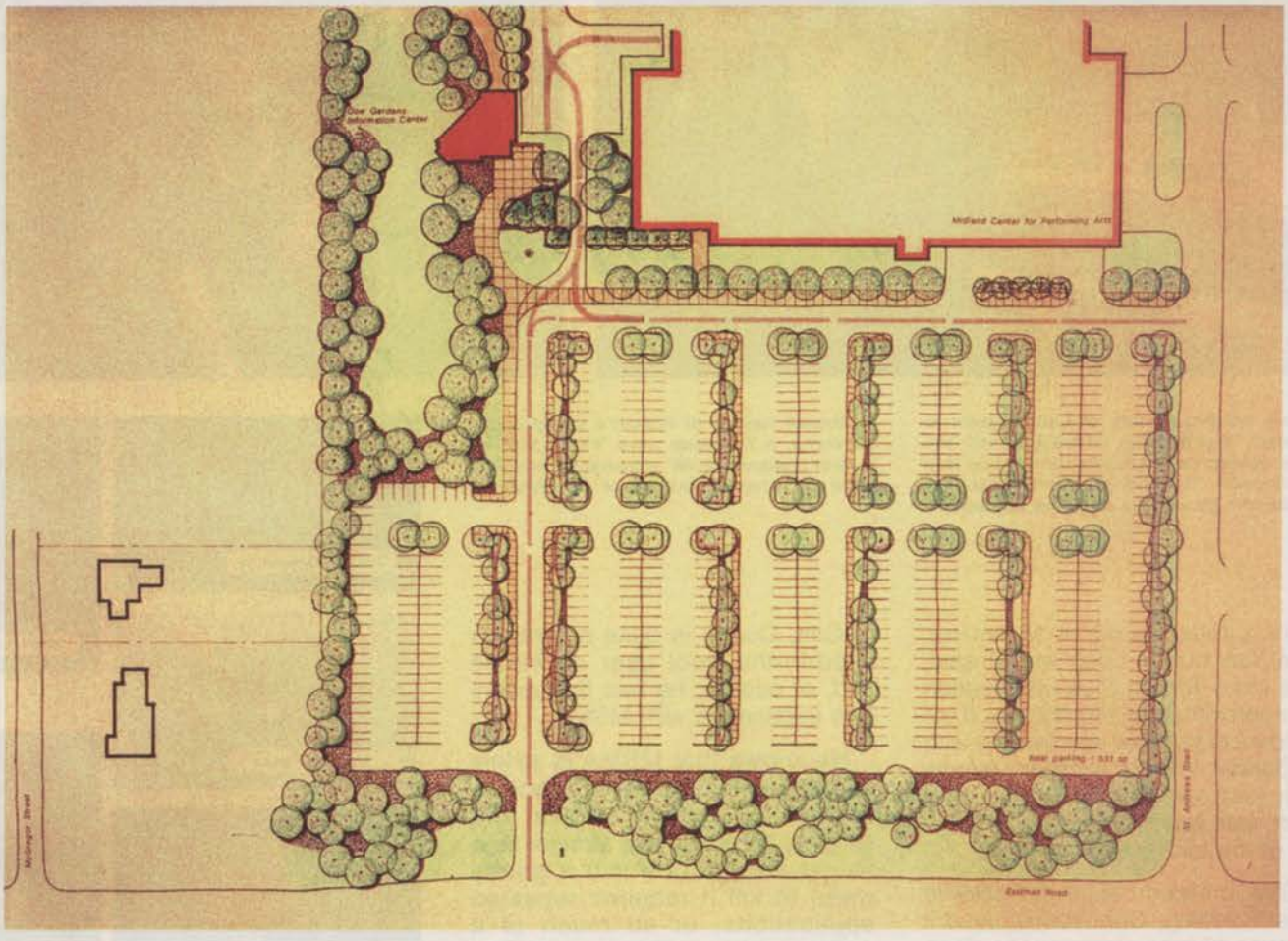

LOW-MAINTENANCE PARKING LOTS

A noted horticulturist tells landscapers how to create functional and cost-effective parking lots by using 'holistic' plants.

by Doug Chapman, Dow Gardens

The ecological approach to designing parking lots can be interesting, colorful and help reduce maintenance costs.

Recently, the parking lot for the Dow Gardens and the Midland Center for the Arts was re-designed. It was adjusted to accommodate 600 parking spots from its original 380. Developing an area with that much asphalt meant that several new objectives had to be met.

The first was simply increasing the number of parking spaces. This had to be met while not detracting from the building architecture of the two organizations the parking lot serviced.

The second objective was continuous traffic flow. With this in mind, two entrance/exits were developed, essentially as far apart as possible, so that the traffic would not overflow to the streets adjoining the entrance to the Gardens.

Creating illusion

A primary objective was to create an illusion that the lot contains only 50 to 80 parking spaces. In doing this, we developed small cells, or individual parking lot sections (for example, red, blue, green-coded sections). Surrounding these areas were significant plantings of trees, shrubs and perennials, creating a visual block. At no point during the growing season would visitors be able to see the entire expansiveness of the parking area.

Another objective was to create a sense of "arrival" at the gardens and art center. This was accomplished by heavily planting in these large (14- to 20-foot wide by 100- to 200-foot deep) planter beds, while allowing visitors to see the entrances to the organizations. In planting these, we tried to create open screening at the entrance drive for the Dow Gardens with dense east-west visual block to reduce the impact of such a large parking lot.

Blocking areas

A new adjustment was to de-emphasize the art center's loading dock at the entrance to the Dow Gardens. This objective was met by curving the road back to this service area. Further,

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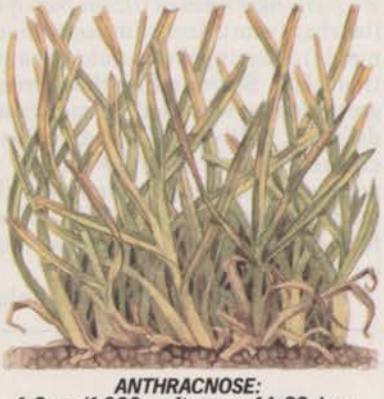
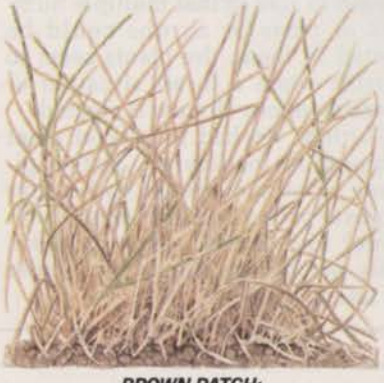
POWDERY MILDEW:
1-2 oz./1,000 sq.ft. every 14-28 days.

SNOW MOLD:
4 oz./1,000 sq.ft. applied late fall.

RUST:
1-2 oz./1,000 sq.ft. every 14-28 days.



ANTHRACNOSE:
1-2 oz./1,000 sq.ft. every 14-28 days.



BROWN PATCH:
2-4 oz./1,000 sq.ft. every 10-21 days.

STRIPE SMUT:
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plantings were installed to create a year-round screen.

The last objective—and most significant from the horticultural point of view—was to develop an ecological home for the plantings. This ecological approach meant that we were going to create a landscape that would have reduced maintenance yet healthy plants by planting them in conditions for which they are suited. The ecological approach is analogous to a holistic approach in human health.

Diverse plantings

After reviewing the general literature, we found research on street trees in urban conditions that was conducted at Cornell University. It stated that if planting areas were increased in size so that multiple numbers of trees or shrubs could be planted in them, the plants seem to flourish when a forest situation or favorable micro-climate is created.

Further, we had to look at plant communities for diversity, be they pioneer or climax trees, understory shrubs or perennials. We wanted individual low maintenance gardens, while not having simply turf under the trees.

So the entire area was excavated down four feet. Underground drains were installed. (The Midland area is essentially the site of an ancient lake bottom and, therefore, heavy clay.) Once the underground drains were put in, two feet of sand was spread throughout the area and compacted. In the parking areas, gravel was installed, compacted and then the asphalt surface was applied. In the planter areas, the final two feet was filled with sandy-loam.

The planter islands are essentially multiples or mirror images of each other. They are either wide planting islands, 100 to 200 feet in length, or they are small planters, with a single tree and perennials.

In the smaller areas, where the single tree and perennials were planted, we put single trees of *Ulmus parvifolia* (lacebark elm), *Acer campestre* (hedge maple) or *Syringa reticulata* (Japanese tree lilac). Surrounding these trees a groundcover was used, in each case, a different cultivar of hemerocallis to create summer color. Further, we wanted herbaceous perennials that would die to the ground and, therefore, not be impacted by snow setting on top of them.

In the long planter islands, unique plantings were developed. For example, where honeylocust (*Gleditsia triacanthos inermis* "Skyline") was used, underplantings of fragrant sumac (*Rhus aromatica*), beach rose (*Rosa rugosa*), little princess spirea (*Spiraea japonica* "Little Princess") and bush cinquefoil (*Potentilla fruticosa*) were planted.

Herbaceous perennials

Further, as we moved closer to the edges, herbaceous perennials were integrated. These included such things as yarrow (*Achillea millefolium*), butterfly weed (*Asclepias tuberosa*), astilbe (*Astilbe chinensis* "Bridal Veil"), painted daisy (*Chrysanthemum coccincea*), blue lyme grass (*Elymus arenarius*), geum (*Geum quellyon*), showy stonecrop (*Sedum spectabile*), speedwell (*Veronica spicata*), and shasta daisy (*Crysanthemum maximum*).

In other planter areas, shade situations were developed. Climax trees, such as sugar maple (*Acer saccharum*), Norway maple (*Acer platanoides*) and red oak (*Quercus rubra*) were planted, with understories of arrowwood viburnum (*Viburnum dentatum*) and blackhaw viburnum (*Viburnum prunifolium*). A

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border planting of light shade herbaceous perennials came to the edge of the planters.

Year-round color

In using this approach, we were able to plant areas that would not need long-term irrigation or mowing. These areas would be colorful spring, summer and fall, yet the plants would not have to be irrigated or pesticides applied because they were put in their correct ecological niche.

This type of planting just became more exciting as we installed it.

In the large planter bed, the soil area was cooler, the rootzones were cooler, moisture was conserved, yet plants that were compatible with each other were planted (companion plants). This first year a significant amount of irrigation, at least every seven to 10 days, will be needed. We anticipate that amount for the establishment year only.

Comfortable walks

The intent, then, is to present the Gardens, breaking up this huge sea of asphalt and yet creating an illusion of being in a park. To add to this illusion, we installed several walk areas 42 inches wide. These were wide enough for one person to comfortably walk. They gave us opportunity to be sensitive to the needs of the pedestrians, getting one out of the flow of traffic. Further, we were able to install small enough walks to give vistors the feeling of an intimate garden path.

The final part of this parking lot garden is, of course, lighting. The lighting was designed to create several images. Large-area lighting—but not as bright as daylight—used large, 24-foot metal halide fixtures.

Up-lighting was placed in the planter beds. This not only provides light at the perimeter but also accentuates the plants' habit growth. As the plants continue to develop, this uplighting will have more and more biomass to reflect against, thus increasing its effectiveness.

A garden stroll

Bollards were placed along the walkways for an intimate feeling of walking down a garden path. These were only 12 inches in height.

The final illusion was to develop facade lighting for the buildings. This gave the patrons the feeling of a new parking lot, a new garden, and new buildings.

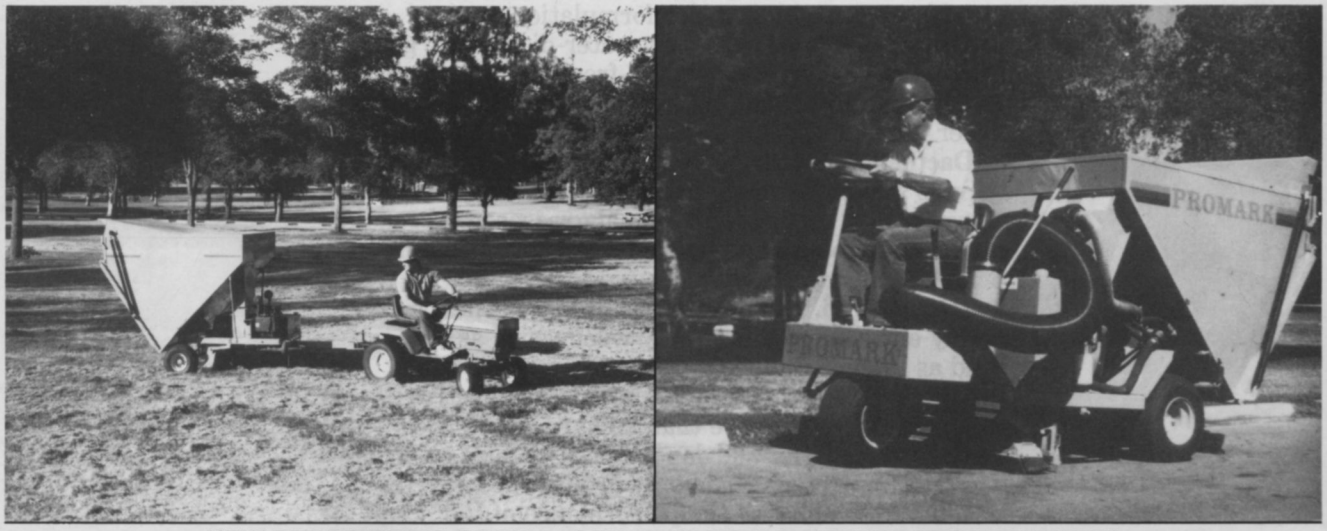
This kind of a project can only be developed in a team approach. We put together the team of Jack Lee, architect and planner from Dow.Howell.Gilmore Associates; Don Hogue, electrical engineer from Dow.Howell.Gilmore Associates; John McPeak, contracter, Fisher Contracting; and Doug Chapman, horticulturist at the Dow Gardens. It certainly took each one of the principles cooperating as a team to complete the project.

We feel this blend of design, function and biologically sensitive landscape development is the key to a more people-friendly, aesthetically-pleasing parking lot.

Some suggest in landscape architecture that geometric form is becoming paramount in the landscape. I would like to say maintenance costs, landscape health and design must go hand in hand.

Horticulturists feel that the plant health and cost of landscape maintenance are paramount. Further, as resources become more limiting, the ecological approach to design and maintenance makes sense (cents). **LM**

Douglas J. Chapman is horticulturist-administrator at The Dow Gardens in Midland, Mich., and an editorial advisor to LANDSCAPE MANAGEMENT.



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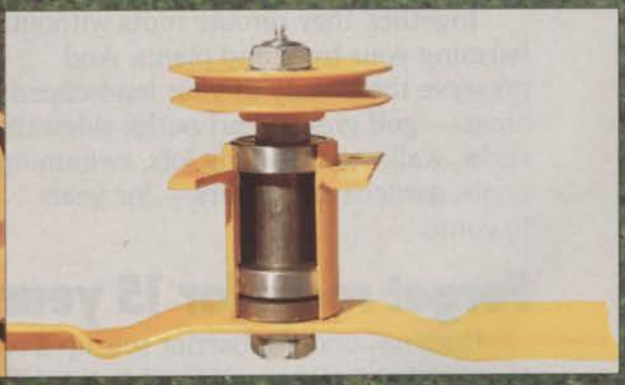

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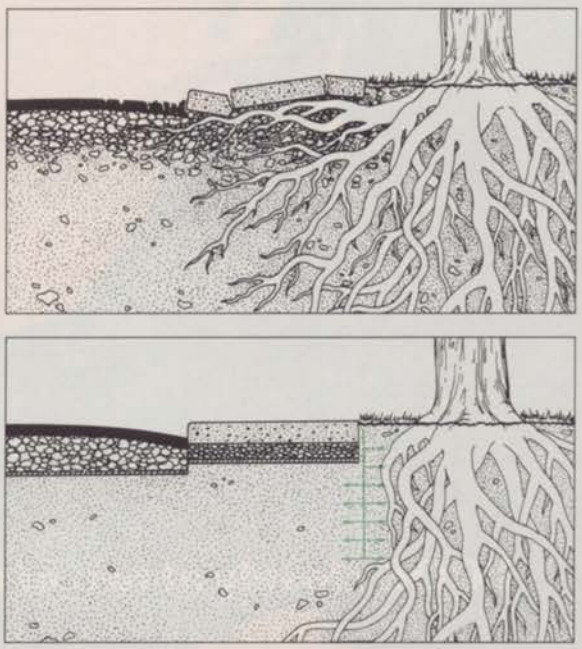

Top Without Biobarrier, tree roots penetrate paved surface and aggregate base, causing unsightly cracking and heaving.

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WHERE IS THE NEXT CUSTOMER?

In your own backyard. Using word-of-mouth advertising combined with a frontal assault on neighbors usually means new business.

by Rudd McGary, Ph.D.

MANAGEMENT IN BUSINESS

No matter what the business, the constant question of owners is, "Where is the next customer?"

In landscaping, this is also a constant. Perhaps this question, more than any other, worries most companies. Owners understand how to *do* the work, but often don't understand how to *get* the work. Here are some ideas about where the next landscaping customer can come from.

Next door!

The best place to find a customer is next door to someone who has purchased your work in the past year.

The buying patterns in landscaping follow what is known as "two-step diffusion." This means that when someone wants to find a landscaper, they seldom ask a landscaper. Instead, they ask someone who is in the same basic age and income range and who might have a recommendation. The most logical person to ask is often a next-door neighbor, particularly if they have seen you doing work on their neighbor's property.

Two-step diffusion simply means that we look for someone who is very much like us and who we feel can render an objective opinion. If you have a group of satisfied customers, then you have a group of next-door neighbors, too.

We need to find ways to get this group to buy what we have. If we can reach them, we should have fairly good success. This holds true whether we are looking at commercial or residential work.

Getting the referral

Most of your customers will give you a referral. They will give you a letter of recommendation if you want one. However, in order to simplify the process of getting such a letter, you should offer to type one out and then have the customer sign it.

Please note that I'm not suggesting that you send them a letter asking for referrals. This is done from time to time, usually in a panic when enough work isn't booked for next month. The response to these letters is usually underwhelming: almost none at all.

If, on the other hand, you have a recommendation letter, you can be more aggressive.

Choose the area

Ask your client if you can take a picture of the work you've done to show other people. Most people are proud to show off their landscaping, and they'll almost always let you take as many photos as you need. That way, you can have both letters of referral and pictures of the type of work you do on file. Both are handy tools that can be used later.

Certain parts of the town or city are better for you. Customers have bought from you in these areas and you have also done some installations. These are the areas in which you are going to look for the next-door neighbor who can be your next client.

Potential customers

People in the three houses across and the two houses next door to your current customer are the most likely to buy your services. (You can find their names in a telephone criss-cross directory.) You need to mail them a brochure showing the sort of work you do. Let them know at the same time that you worked for their neighbor.

Often, blueprints and plans for installations make good backgrounds for brochures. You should put together a short, full-color, no-photo brochure—one that has line drawings instead of photos. People are attracted to good line drawings. If you can't draw, find someone at the local college to help you. Usually, the art professor will know someone he or she can recommend.

In the brochure, explain that you have worked with people living close to your prospects. Then you need to let them know, as simply as possible, the types of services you provide. Finally, let them know how to reach you, and you've included all the necessary information. Don't write too much: the prospect will get bored. If the artwork is nice, you'll be fine with very few words.

When they call

If you've done all of the above things, maybe one of these people will call you. When they do, set your appointment and gather up all your different tools, particularly the referral letter and the photographs.

When you make your presentation (or at least at the opening of your call), make sure that your letter of referral and photographs are seen by the prospect. Remember: you can talk a great deal, but it makes a difference if someone to whom the prospect can relate has already actually bought your services. Let the pictures do the talking; if they're good, they'll help do the selling for you.

Finishing up

When you begin this new job, make sure you snap photos on the day you begin and on the day you end. If you are doing major work, there should be dramatic photographs showing the changes.

Once again, the person living next to this one will be the best next customer, and by saving evidence of how you did with your current customer, you can make a much stronger impression on the next one. **LM**

Rudd McGary, Ph.D., is a senior consultant with All-Green Management Associates, Columbus, Ohio.

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So excel with XL. See your Elanco distributor. Or call toll-free: **1-800-352-6776.**

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Circle No. 116 on Reader Inquiry Card

XL™ excels.

For longer-lasting, broad-spectrum weed control, excel with granular XL.

Applications of lime which amount to less than 50 lbs. per 1000 sq.ft. will disappear from the homeowner's view after one or two rains.

LIME: SIMPLE AND CHEAP, BUT SO EFFECTIVE

Nitrogen fertilization should be countered occasionally by lime, which safely and effectively reduces soil acidity.

by Stephen J. Donohue, VPI-SU

In order to establish and maintain a high quality turf, additions of fertilizer and lime by the lawn care/landscape supervisor are sometimes needed.

While close attention is often paid to fertilization programs, the same is not normally true for lime. However, lime is a very simple material to apply, it is inexpensive compared to other materials and it is extremely effective in promoting good quality turf.

Determining needs

It is quite simple to determine if lime need be applied to turf by testing the soil. Most soils in Virginia are naturally acid and require limestone to neutralize this acidity. Also, as most nitrogen fertilizers used on turf make soil more acid, this should be countered by periodic lime additions. Since too much lime can be as harmful as too little, it is essential that the soil be tested beforehand.

In Virginia (and most other states), information on how to have soil tested may be obtained directly through the local cooperative extension office. These offices provide information on how to collect a sample as well as soil sample boxes and lawn information questionnaires. Most land grant universities have soil testing and plant analysis laboratories that offer testing services and information on amounts and types of fertilizer and lime to use.

The application

Limestone is simple to apply, either with a drop spreader or a spinner (centrifugal) spreader. Uniform coverage of the lawn is important. Overlaps and skipped areas should be avoided. For best results, one-half of the lime should be applied in one direction, and the remainder applied in a perpendicular (crisscross pattern) direction.

If using ground lime, it is simple to determine if coverage is uniform because of the visible white color of the material. More care should be taken if pelletized lime is used.

Lime can be applied at any time. It is recommended that lime be applied in the fall to enable the material to break down over the winter for the next season's growth. But if the soil is tested in the spring and lime is needed, it should be applied at that time. Lime will begin to react immediately upon application and will reduce acidity and improve turf growth through the summer and fall.

Lime is safe to use. The common

This text is adapted from a speech given at the Virginia Turfgrass Conference by Dr. Stephen J. Donohue, professor of agronomy and extension specialist in the Department of Crop and Soil Environmental Sciences at Virginia Polytech Institute and State University.

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Circle No. 138 on Reader Inquiry Card

forms of lime applied to turf—ag lime, calcitic lime and dolomitic lime—are non-toxic to humans and grass, and will not cause pollution problems.

If the proper amount of lime is applied to bring the soil pH to 6.5, the application should last four to six years.

Lime is a critical factor in keeping soil pH around 6.5 for good turf growing conditions on most athletic fields.

If applying lime to established turf and the recommendation calls for more than 50 lbs. per 1000 sq.ft., the lime application should be split with no more than 50. lbs. per 1000 sq.ft. being applied at any one time. Additional applications, when needed, should be applied three to six months after the first application. The reason for split application in these situations is aesthetic. Lime is white and while applications of less than 50 lbs. per 1000 sq.ft. will disappear from the surface after one or two rains, larger amounts will remain visible for a longer period of time, which is undesirable from a homeowner's point of view.

Lime is even simple to produce. The lime material used on turf is nothing more than crushed lime bedrock.

Collecting lime

At a lime quarry, topsoil is removed with a bulldozer, exposing the limestone bedrock. The bedrock is loosened using dynamite charges and the broken-up material is then transferred, usually by conveyor, to a crusher or pulverizer where it is ground to the proper fineness. It is necessary to grind limestone to a very small particle size since it is very insoluble and the surface area of the material must be increased for it to react adequately with the soil.

When compared with other materials applied to turf, lime is very inexpensive. Lime costs are but 1/3 to 1/10 the cost of fertilizer. Lime is a real bargain at those prices.

Lime's effects

Lime is effective in so many ways. Its main benefit is neutralizing soil acidity.

There are two forms of acidity in soil, active and reserve. Active acidity refers to the actual concentration of hydrogen ions in the soil solution.

Uniform coverage of the lawn is important.

This is the acidity that is measured in a soil pH test. This form of acidity amounts to only a small portion of the total acidity in the soil; it could be neutralized by applying merely a couple of teaspoons of lime per 1000 sq.ft.

Most of the acidity in soil is in the reserve form. It consists of aluminum and hydrogen held loosely on the edges of clay particles.

Other benefits

In addition to neutralizing acidity, limestone supplies calcium and sometimes magnesium for plant growth. Common aglime supplies abundant amounts of calcium. The same is true for calcitic lime. Dolomitic lime, on the other hand, supplies both calcium and magnesium. These two essential plant nutrients are required for good turf growth.

Limestone also increases the plant availability of nitrogen, phosphorus and potassium in an acid soil. All three nutrients undergo reactions in the soil when lime is applied to increase their availability to the plant. It should be noted that, when fertilizer is applied to a very acid soil, an appreciable portion will undergo chemical reactions that reduce its availability. By liming a soil, the efficiency of fertilizer use is increased.

Boosting pH levels

In addition to increasing availability of major plant nutrients, limestone reduces the availability of aluminum and manganese, the two elements primarily responsible for poor growth at low soil pH levels. Application of lime with resultant rise in pH causes aluminum and manganese to undergo reactions which render them unavailable. These elements exist in very unavailable forms at neutral soil pH levels.

Another benefit of lime is that it improves soil structure. This is due to the "bridging" effect of calcium (as well as magnesium) between clay particles and also because of an increase in microbial activity. Soil micro-organisms help break down organic material in soil, and the resultant "glue" that is produced helps bind soil particles together.

While not present to any great extent in Virginia, soils that are high in sodium (which causes dispersion and breakdown in soil structure) are aided by limestone in that the calcium displaces sodium which is then leached out of the soil.

Counteracting acidity

Another beneficial effect of lime, particularly important in turf production, is that it counteracts acidity caused by certain nitrogen fertilizers.

Ammonium nitrate and urea, two commonly-used nitrogen fertilizers, break down in the soil to produce nitric acid. Approximately 1¾ lbs. of pure lime is needed to neutralize the acidity caused by 1 lb. of nitrogen from each of these fertilizers. In a yearly fertilization program where a total of 4 lbs. of nitrogen is applied per 1000 sq.ft., approximately 7¾ lbs. of pure lime is needed to neutralize the acidity the nitrogen fertilizer produces.

These then are the benefits of using limestone on turf. Limestone is a simple material: simple to determine if needed, simple to apply, simple from the standpoint of its longevity and infrequent application need—yet a real bargain in terms of cost and benefit to the turf. **LM**

There's a better way to relieve ornamental replacement headaches.

In fact, there are two ways to relieve ornamental replacement headaches caused by disease damage: CHIPCO® ALIETTE® and CHIPCO® 26019 fungicides. CHIPCO® ALIETTE® brand fungicide tackles Phytophthora root rot and Pythium with powerful systemic action that puts long-lasting control inside each plant. Plus, CHIPCO® ALIETTE® brand provides two-way disease protection: First, by directly attacking disease organisms; and then, by helping plants build up their own disease defense mechanisms. And for the broadest spectrum disease control you can buy, depend on CHIPCO® 26019 fungicide. One economical application of CHIPCO® 26019 provides lasting protection against 13 of the most damaging ornamental diseases. And CHIPCO® brand 26019 fungicide does not cause phytotoxicity problems. So, you can use it with confidence on the most sensitive varieties. This year, save the aspirin for other headaches. Cure ornamental diseases with the powerful fungicide team from CHIPCO®.

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Circle No. 158 on Reader Inquiry Card

Computer images: landscape selling tools?

A new computer imaging service allows landscapers and architects to show their customers what their properties will look like at maturity.

The graphic service is offered by LandScopes, Inc., a Virginia-based computer imaging service that helps designers sell customers imagined landscape plans for home or commercial properties.

The company merges a photograph of the site with digitized images of real botanical specimens and garden elements, and the designer receives a full-color computer printout of the site at plant maturity.

The service spares the landscaper the costly investment of purchasing computer-aided equipment or the expense of employing a graphic artist. Also, the realistic pictures significantly help the customer understand traditional overhead plot plans or architectural line drawings. The net result is improved customer understanding and reduced costs due to design changes, according to the company.

The landscaper provides $200, two photos of the property and a list of the desired landscape elements...

...and the LandScopes package creates the desired landscape using as many as 15 plants or garden elements.

A truer image

"Traditional plot plans, line drawings, or even watercolor sketches leave a lot of room for mismatched visions between designers and customers," says Sheila D. McKisic, LandScopes' president. "Even CAD drawings can be visually misconstrued by clients, and making changes can cause lengthy delays resulting in missed sales opportunities."

With the LandScopes process, however, once the photograph of the site has been processed by the computer, any number of designs can be merged with the image as necessity, time and budget permit, she adds.

The landscaper provides to the company a standard plot plan, a list of plants and landscape elements to be incorporated and two 35 mm photographs of the desired "view." One of the photos is to include markers for accurate plant placement. A standard LandScopes package costs approximately $200 and includes one view of the site and up to 15 different landscape elements.

"The simplicity of the process makes it possible for the landscaper to use the same plant in several locations without additional cost," says McKisic. The company charges a nominal fee if more than 15 plants or garden elements are used. The designer receives a full-color, 8- by 10-inch printout of the property.

"The great flexibility of the process allows for a myriad of customized plans. Unwanted existing plants and elements can be removed; plants can be pruned or relocated, the grounds can be graded; custom elements such as sculptures or fountains can be added; panoramic views up to 360 degrees can be processed; and large printouts are available for framing," she adds.

It's easier to sell when the designer and client know what the finished project looks like.

More than plants

The LandScopes library of images incorporates the new American Association of Nurserymen coding standard. It includes images of non-botanical elements such as fences, walls, fountains, bridges, patios, etc. Even the image of the house can be changed to accurately show its color or orientation.

"Landscaping professionals know that many of their customers would prefer to look at a realistic picture rather than a line drawing," says McKisic. "Experience shows that it's easier to gain agreement and reach closure on a sale when the designer and client share the same vision of what the finished product will look like." **LM**

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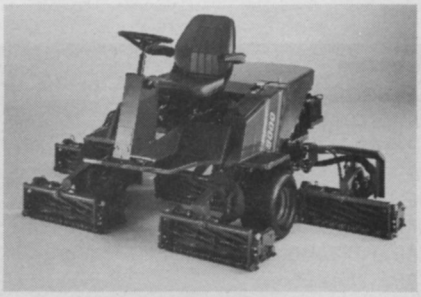
PRODUCTS

Fairway mower designed for a wider cut

Ransomes, Inc. has introduced a new "state-of-the-art" mower designed for top quality golf course fairway mowing. The Fairway 5000 provides the fine cutting quality of a greens mower, but has a speed of 6 mph and a wider cutting swath of 106 inches.

Ransomes says the Fairway 5000 was engineered for long hours of daily use. It has added special features for more operator comfort, such as a high-



back suspension seat with arm rests, and four-inch fore and aft adjustment; power steering and tilt steering wheel, readable gauges and well-positioned controls; and all-hydraulic design for raising and lowering cutting units.

Circle No. 191 on Reader Inquiry Card

Versatile backhoe adapts to new trencher line

The T906 Bobcat backhoe is a handy complement to Melroe's new Bobcat 3020 Series trencher line. The T906 digs to depths of up to six feet depths. A 180-degree boom swing makes it a versatile tool for digging access holes

ground boring as well as removing rocks, or digging to gas or water mains. It uses two control levers, one for boom and swing, the other for dipperstick and bucket operation. A third lever controls the 69-inch wide backfill blade, which acts as a stabilizer. The operator is situated high for excellent visibility. Four different bucket sizes are available for a variety of digging conditions.

Circle No. 192 on Reader Inquiry Card.

Backhoe now attaches to skid steer loader

Du-Al Manufacturing Co. has adapted its Model 1015 backhoe to skid steer loaders and three-point hitch tractors. Quick detach linkage locks the backhoe to the body of the skid steer, removing digging forces from the loader's bucket cylinders. Designed to fit in close to the skid steer, these units may be mounted or dismounted in five minutes or less.

The Model 1015 has a digging depth of 7½ inches. It fits skid steer units with lift capacities of 800 to 1200 lbs. Du-Al says the 900 lb. working weight of the backhoe makes it an ideal companion for the small skid steer loaders for light commercial applications.

Circle No. 193 on Reader Inquiry Card

New lawn tractor line designed for efficiency

The new Lawn Tractor LT series from Simplicity—the 12.5 LTH and 16 LTH units—can groom rough, hilly terrain and increase mowing efficiency. Simplicity says the tractors have the tightest turning radius (16 inches) of any lawn tractor in its class. New quick-hitch mowing decks can be removed within 30 seconds, in order to attach snowthrowers and other attachments.

Both tractors are powered by Briggs & Stratton Vanguard engines. The 12.5 LTH unit accomodates a unique 38-inch two-blade mower. The 16 LTH has a 44-inch, three-blade deck.

Circle No. 194 on Reader Inquiry Card

Low maintenance, positive drive in new hydro-gear

The latest addition to the Dixon line of Zero Turning Radius mowers is the new ZTR 503 HG, a 50-inch cut commercial-grade mower with hydrostatic gear drive. The ZTR 503 HG has

a true zero radius turn and simple hand lever controls that eliminate all footwork.

Dixon says that the drive system is the first such system on a Dixon mower, and is "technologically steps ahead of competitive comparables." Chief engineer Clair Splittstoesser says the Hydro-Gear drive delivers a more positive, responsive drive action, while the self-lubricating hydrostatic gear drive has no chains, sprockets or shafts, reducing maintenance or possible downtime.

Circle No. 195 on Reader Inquiry Card

Sickle bar mower allows better contour mowing

The Troy-Bilt Trail Blazer sickle bar mower enables the mower to follow ground contours independent of wheels and chassis to eliminate "scalping" or hang-ups on uneven terrain. The mower is now manufactured in the U.S. and has a full six-year warranty.

The unit also has an exclusive, tangle-free blade that can mow 1,500 square feet of overgrown brush in just five minutes. Also included are 19 induction-hardened steel knives that stay sharp through many hours of use

continued on page 102

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Circle No. 157 on Reader Inquiry Card

Individual blades can be replaced.

Cutting widths are 34- and 38-inches. A grass diverter moves at 840

rpm and prevents build-up, tangling and clogging by knocking weeds, grass and brush to the side after cutting.

Circle No. 196 on Reader Inquiry Card

Pump/motor system drives new hydro

Scag Power Equipment introduces a new hydrostatic riding mower that combines two heavy-duty White motors and a rugged Sundstrand pump. According to Scag, each component can be easily serviced with a minimum of downtime and labor cost.

For controlled deck floatation, the hydro features a special pneumatic "racing" shock absorber which enhances cutting performance and increases operator comfort. Drive wheels have a wider stance for added stability on hillsides. Top speed is 8 mph.

Circle No. 197 on Reader Inquiry Card

Mower designed from 'cutters point of view'

The new Pro Master 20H hydrostatic front-mount mower has zero-turning radius for tight situations and speed for the straight aways.

The unit has all controls, switches

and gauges on the instrument panel. A softer seat, hydraulic deck lift, 60-inch mower deck and tool/debris box are all standard. A 5.6 bushel Grasscatcher attachment is available.

Circle No. 198 on Reader Inquiry Card

New golf car fleet features new suspension

Yamaha Motor Corporation has introduced the 1990 G8 fleet Classic. "Ultra Path" three-link rear suspension provides better shock absorption and greater steering responsiveness.

The Classic is available in two versions. The electric G8-E has a Yamaha

Stop crabgrass from grabbing hold

Once crabgrass takes hold, you're the one who gets squeezed. Angry customers want your neck.

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designed and built "Pace Setter" solid-state speed controller that makes the abrupt start a thing of the past and ensures smooth acceleration and a quiet, even ride. The gas-powered G8-A is driven by an overhead valve, 4-stroke engine, which Yamaha says is the first of its kind

built exclusively for golf cars.

Corrosion-proof, metton body has been expanded to provide a longer wheelbase and greater legroom.

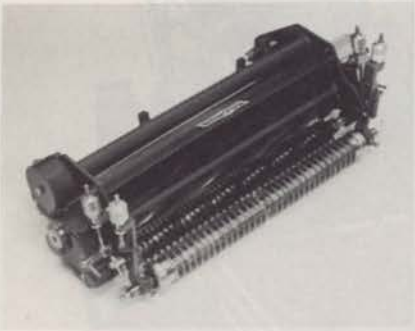
The car comes with a comprehensive, three-year parts and labor warranty.

Circle No. 199 on Reader Inquiry Card

Reel attachment reduces thatch, runner problems

Bunton Company is now offering a greens conditioner reel for use with its Triplex greensmower.

Vertical knife blades are optimally spaced in a helical pattern on ½-inch centers. Heavy-duty gear motors assure a high frequency of clip while conditioning the greens. The depth adjustment of the reel is infinitely



variable within its range to assure precision greens care.

The conditioner features a steel gear drive to eliminate problems associated with reels which use belt drive systems. Many of the components on this new conditioner are interchangeable with components on the Bunton walking greensmower to minimize spare parts inventory.

Circle No. 200 on Reader Inquiry Card

New trencher features advance-design hydraulics

The Charles Machine Works, Inc. has introduced the Model 3500 all-hydraulic, 35-hp trencher.

The trencher is designed for rental yards, electric utilities, utility contractors, and landscape and irrigation contractors.

The company says the four-wheel drive, rigid-frame machine is the only trencher in its class featuring advanced-design hydraulics.

"The Model 3500 incorporates the latest improvements in hydraulic drive technology," says Scott Pollman, product manager. "An efficient hydraulic drive radial piston motor is the heart of the 3500's digging attachment. It's low speed and high torque allow plenty of power for the roughest

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Circle No. 120 on Reader Inquiry Card

digging conditions."

Circle No. 201 on Reader Inquiry Card

Lots of traction action supports hillside mower

The Hustler 640 Hillsider from Excel Industries features full-time 6-wheel drive for traction, stability and comfort.

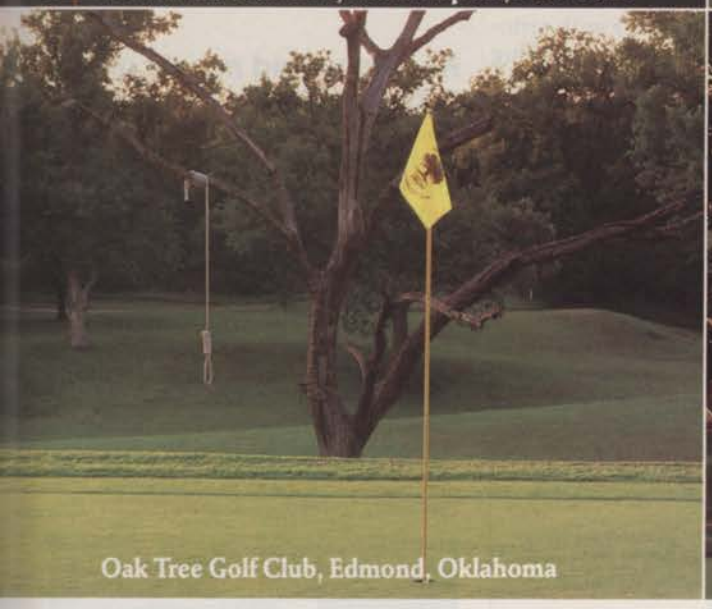
The mower's self-leveling feature increases driver confidence and reduces fatigue by automatically tilting to keep the operator's station level.

This design is unique, according to Excel, because the engine is also held level, allowing for proper lubrication at all times. The tractor's weight distribution remains constant over the drive wheels for unmatched traction and balance.

The 640's dual-hydrostatic drive system and power-assist wheel lift make zero radius turning possible and significantly reduces turf damage. One-hand hydraulic steering gives

Shinnecock Hills Golf Club, Southampton, New York

Southern Hills Country Club, Tulsa, Oklahoma



Oak Tree Golf Club, Edmond, Oklahoma

Medinah Country Club, Medinah, Illinois

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Either way, for over 20 years Betasan has been earning the trust of the most demanding and knowledgeable golf course superintendents in the country.

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the operator total control of speed, braking and turns, without the use of clutch or brake pedals.
Circle No. 202 on Reader Inquiry Card

No more shifting, thanks to the hydrostatic drive

Snapper Power Equipment has eliminated shifting in its yard tractors with a foot-controlled hydrostatic drive with cruise-type speed control to maintain a constant speed without

keeping constant pressure on the pedal. Mower operation has been simplified by an electric front PTO clutch with fingertip control.

A twin-cylinder, 18 hp commercial duty engine with horizontal crankshaft, pressure lube and oil filter is among the many standard features.

The tractor also includes a seven-position tilt steering wheel, a padded, high-back adjustable seat, a nine-position cutting height, pneumatic tires with turf-gripping tread and a 10-quart gas tank.

Options include a 5-hp tiller, dump cart, dozerblade, two-stage snowthrower, tirechains, rear wheel weights and rear weight kit.
Circle No. 203 on Reader Inquiry Card

Riding mower features rear-wheel steering

A new 12-hp riding mower with articulated rear-wheel steering, a cutting radius of 3.5 feet and a front-mounted mowing deck is now available from Husqvarna Forest & Garden's North American network of servicing dealers.

The Model 850-12 features five forward speeds. The result is a maximum forward speed of 4.6 mph and a maximum reverse speed of 1.7 mph.

The front-mounted three-blade mower deck has been redesigned for greater lift and cutting ability. Height adjustments also are increased from 1 inch to 4 inches with six evenly-

spaced increments for more exact work.
Circle No. 204 on Reader Inquiry Card

Reel-mounted mower unit converts tractor into mower

The 86-inch reel-mounted mower package from John Deere includes three 30-inch hydraulically-driven mowers that can be attached to a John Deere model 755 or 855 compact utility tractor. If the tractor is needed for other jobs, the rear sub-frame and mower can be removed in minutes to expose a rear PTO and drawbar.

The hydraulic reel drive pump is powered by the tractor's mid-PTO. Reels turn at about 940 rpm for a consistent cut. One set of quick couplers can be reversed for backlapping. The reels are raised and lowered by the

tractor's open center hydraulic system. As a safety measure, reels stop when lifted out of working position.

Both tractors are powered by a 3-cylinder diesel engine. The 20-hp 755 delivers 15-hp at the PTO. The 24-hp delivers 19-hp at the PTO.
Circle No. 205 on Reader Inquiry Card

New verticle reel line includes a 7-gang unit

Kubota Tractor Corporation has launched the Verti-Reel product line of complete mowing and cutting units built for total turf maintenance.

The line features a 5-gang unit and a 7-gang unit. The 5-gang Verti-Reel unit is designed for use with the Kubota L3250F Turf Special tractor. The 7-gang unit operates with the M4030SU Turf Special tractor. The power pack, mouunted on the tractors' 3-point hydraulic hitch, enables

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With Cutless, your turfgrass can outlast all other plant species for water. Well, with a few exceptions. Send for your free Cutless technical guide. See your DowElanco distributor or call toll-free: **1-800-352-6776.**

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Circle No. 114 on Reader Inquiry Card

the operator to clearly view the reels as they cut. By placing the power pack on the 3-point hitch, it allows the operator to turn lock to lock without rear- tires-to-mower-frame interference, a common problem in com-

petitive models. It has convenient access for servicing and adjustments and can be easily disconnected from the tractor for other jobs.

Circle No. 206 on Reader Inquiry Card

Heavy-duty mower line boasts easier operation

The Toro Company has introduced improvements to its heavy-duty line of ProLine mowers which increase ease of operation and performance.

Toro has added a new self-propelling system for longer life; a new fuel tank which is 33 percent larger; and Vac-U-Power blades for improved bagging.

In tests with commercial cutters, the new self-propelling system lasted three times longer than standard systems, according to Toro. The redesigned transmission includes new needle bearings with grease seals on

the output shaft for increased durability.

The transmission's center pull engagement allows for equal load on the bearings instead of loading one side. The reversed gear sequence has a third gear in the center to match up with the center pull engagement to allow for equal load on the output shaft.

Circle No. 207 on Reader Inquiry Card

Intermediate-size mower manuevers well in close

Encore Manufacturing announces the addition of another intermediate-size

mower to its PRO-Line of commercial equipment.

The latest addition, the 32" PRO,

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Most commercial mowing operations are using walk-behind mowers because they have concluded no rider mower is compact or maneuverable enough to mow landscaped areas. Now maintenance operators all across the country are discovering the compact, maneuverable *Mid-Size Walker Mower* fits their job and saves labor (usually cuts labor 1/2). The labor saving *Walker* looks good whether your business is trying to produce profit or is operating on a budget. Write or call for a free brochure. Ask for a demonstration.

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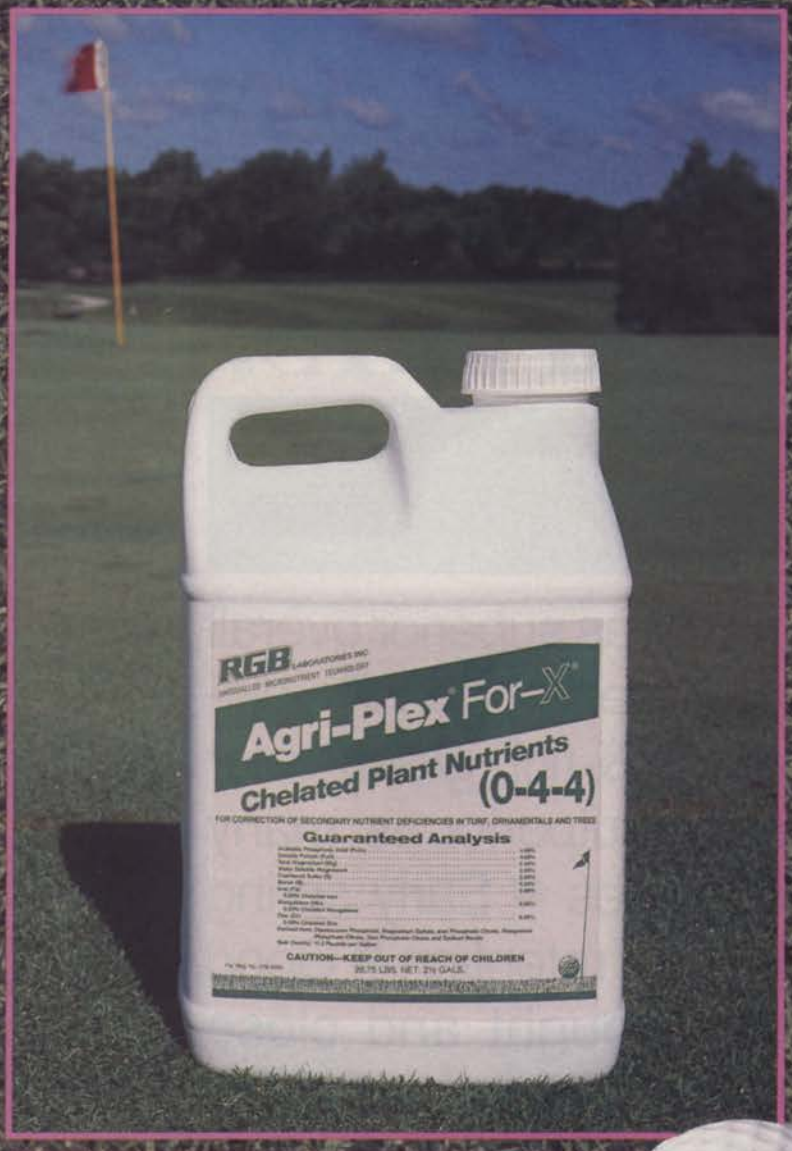

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Circle No. 101 on Reader Inquiry Card

was designed for landscape and maintenance professionals who work within fenced or enclosed areas. The deck will pass through standard gates and entries. The unit is available with a 12.5 hp Kawasaki or 12 hp Briggs and Stratton engine.

All Encore mowers include double V-band belt, 5-speed transmission, diagonal left deck corner for easy trimming, lightweight pneumatic or semi-pneumatic tires and high-lift blades.

Circle No. 208 on Reader Inquiry Card

Literature on gas, diesel models now available

Top-of-the-line liquid-cooled gas or diesel powered and Gemini direct drive hydrostatic performance are some of the features outlined in new four-color literature on Models 718D and 721 models from The Grasshopper Company.

Specifications such as engines are listed, showing the 718D with a 16.5-hp liquid-cooled Kubota diesel engine and the 721 with a 21-hp liquid-cooled Kubota gasoline powerplant.

Other features are true zero-turn-radius and PTO-driven outfront decks from 44 to 72 inches.

Circle No. 209 on Reader Inquiry Card

Okay for cooking, but not for home lawns

Image herbicide from Cyanamid Agricultural Division provides post-emergence control of wild onion and wild garlic.

Wild onion and wild garlic are considered to be weeds that are difficult to control, and that appear most often in late fall and winter. The key to eliminating them, says Cyanamid, is to successfully control the underground bulbs they produce. These weeds are not effectively controlled by contact herbicides because the food stored in the root systems supports regrowth.

Cyanamid says Image kills both the foliage and the roots by interrupting plant protein production, effectively starving target plants.

Weed growth stops within two weeks of application, stored food is used up and the weeds wither away. After mowing, weeds in the process of dying do not emerge above the grass canopy, but remain invisible.

With Image, weeds turn brown gradually, without the immediate, unsightly brownout of contact herbicides.

Circle No. 211 on Reader Inquiry Card

continued on page 112

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Circle No. 162 on Reader Inquiry Card

Landscape software updated by creator

An updated version of the 1.91 Landscape Plant Manager computer software program has been released by its creator, Robert W. Bouffard, a landscape and grounds management instructor at Ohio State University.

The program was developed for the management of landscape plant information for use by students, homeowners, and landscapers. Information about plants is divided into fields of information such as scientific name, common name and design criteria.

With up to 24 design criteria such as seasonal leaf color, height, growth rate, bloom colors, etc., the user can select plants that are aesthetically pleasing and meet design criteria.

The program is designed to work with IBM PC series or any true compatible computer. It has the capacity for 2,000 or more entries of plant records.

"This program offers a much quicker way to research plants for landscape designers. It replaces hours of browsing through catalogs and gives the user a chance to design using very specific design criteria," says Boufford.

Circle No. 212 on Reader Inquiry Card.

Root growth enhancers are concentrated stimulants

Roots and Iron Roots are concentrated liquid biostimulants developed by Roots, Inc. with scientists from the Yale School of Forestry.

Roots is a natural biostimulant containing peat humic extracts, marine algae extracts, intermediate metabolites and co-enzymes. It is formulated to promote root growth and stress tolerance in the establishment and transplanting of horticultural and agricultural crops. Benefits include reduced transplant damage and loss, and quick establishment of new seedings and ground cover.

Circle No. 213 on Reader Inquiry Card

Out-front rotary mower has liquid-cooled engine

Howard Price Turf Equipment has introduced its new Turf Blazer 530 out-front rotary mower.

The Turf Blazer 530 offers a liquid-cooled, 22 hp Yanmar diesel engine, a variable speed hydrostatic transmission and a choice of 48-, 60- or 72-inch decks.

Automotive power steering is standard equipment.

Howard Price says the unit can be equipped with optional cab and complete steel cab and snowblower assembly for winter applications.

Circle No. 214 on Reader Inquiry Card

Features make new trimmer easier to use

Snapper Power Equipment has introduced the Roll-Around-Trimmer, an easy-to-use "wheel" trimmer.

The 21cc trimmer is easy to start with its primer assist mechanism and conveniently-located gas tank. Its two-wheeled chassis is built to carry its own weight, which means less strain on the operator's arms and back. The trimmer's pivoting, adjustable handles, which fold up for easy storage and transport, allow for smooth and precise maneuverability.

Standard features include a centrifugal clutch, straight shaft gear head, large fuel tank and 16-inch cutting swath.

Circle No. 215 on Reader Inquiry Card

Trace element counteracts alkaline soils, chlorosis

Pax Company has just introduced a trace element product called ReNew. It's a highly sophisticated iron formula that will help counteract alkaline soils and overcome chlorosis.

ReNew will help form chlorophyll, which is essential to all plant life. It contains 13 percent sulphur to help plants withstand weather extremes and to improve alkaline soils.

The product also contains 1.3 percent zinc, manganese and other soil-enriching trace elements. It may be used on all types of turf and plant growth.

Circle No. 216 on Reader Inquiry Card

Broad-spectrum fungicide wards off 65 diseases

Daconil 2787 WDG, an easy-to-use broad spectrum fungicide from Fermenta Corp., offers protection from more than 65 diseases that can damage ornamental foliage, flowers and bulbs, shrubs, trees and turf. The product is a water dispersible, granular fungicide that mixes quickly in water without causing dust. It is packaged in a five-pound, reclosable plastic jug.

Daconil 2787 WDG contains the active ingredient chlorothalonil. It protects 25 types of broadleaf trees and shrubs, 17 bulbs and flowering plants, eight foliage plants, three varieties of conifers and a wide range of golf course and lawn turfgrasses.

Circle No. 217 on Reader Inquiry Card

Circle No. 131 on Reader Inquiry Card

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Whatever your application, Yazoo has a mower to maximize your time on the job. Choose a cutting width from 20″ to 76″; with high performance engines strong enough to meet your needs. All Yazoo mowers are designed for tough turf, but their responsive handling will leave your lawn with a smooth, professional finish.

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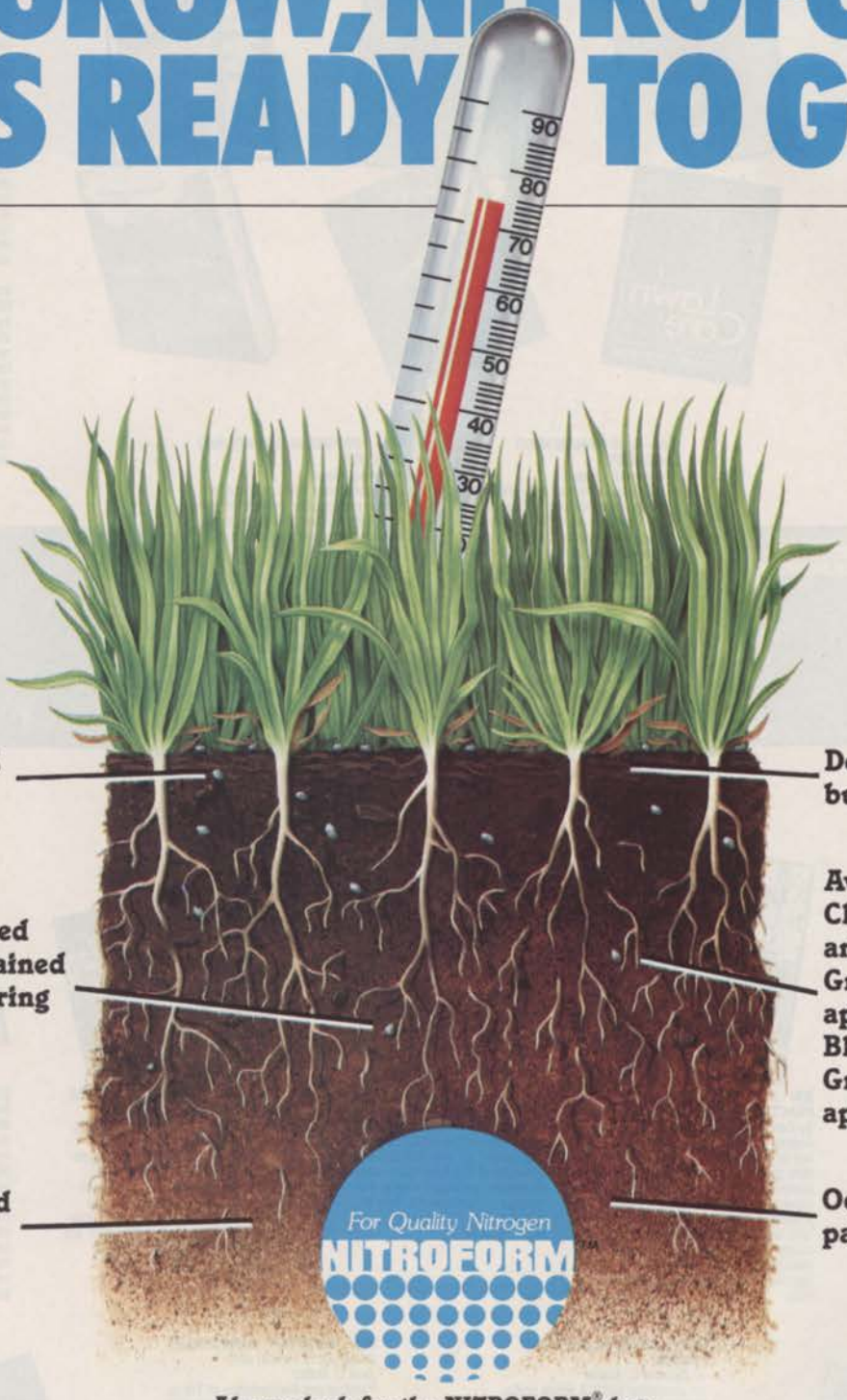

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Circle No. 147 on Reader Inquiry Card

BOOKSTORE

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Leading U.S. turf pathologists report on turfgrass diseases, pythium blight, snow molds, fairy rings, leaf spot of Kentucky bluegrass in Minnesota, initial and field fungicide screening, turfgrass disease resistance, etc. Contains new ideas on how to combat turfgrass problems. **$27.95**

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by Shurtleff, Fermanian, Randell
New comprehensive guide provides the most up-to-date information available on the identification, biology, control and management of every type of turfgrass pest. **$46.00**

230 - LAWNS-Third Edition
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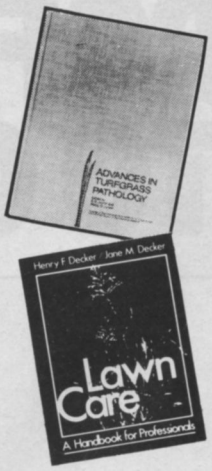

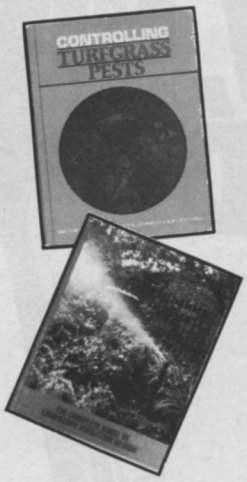

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235 - LAWN CARE: A HANDBOOK FOR PROFESSIONALS
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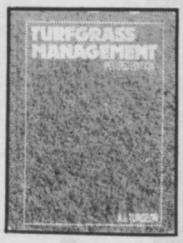
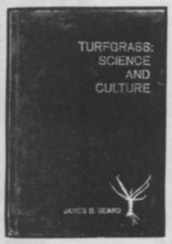
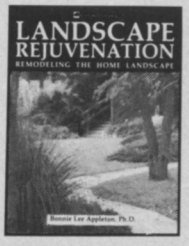
by James Beard
Written by an eminent turfgrass researcher, this USGA sponsored text is an ideal reference and "how to" guide. Details all phases of golf course design and construction, turf management, course administration, irrigation, equipment and disease and pest control. Fully illustrated. **$52.75**





345 - COST DATA FOR LANDSCAPE CONSTRUCTION 1990
Kathleen W. Kerr, Editor
An updated unit cost data reference for designers and cost estimators. Developed to fill the tremendous need for detailed landscape construction cost data. Laid out in easy-to-use CSI format. Annual. **$39.95**

300 - LANDSCAPE DESIGN: A PRACTICAL APPROACH
by Leroy Hannebaum
Geared for the commercial designer/salesperson, this is a one-stop guide to the landscape design process. Covers the entire highly competitive field including design analysis techniques, pointers on land forms, specialized business landscaping methods, environmental design guidelines, specifications, estimations, bids. **$52.00**



320 - LANDSCAPE REJUVENATION
By Bonnie Lee Appleton
Explains how to rejuvenate a landscape renovation. Included is information on how to make an appraisal of the landscape, how to determine landscape needs, maintenance considerations, how to execute a landscape renovation. **$15.95**

375 - RESIDENTIAL LANDSCAPES
by Gregory M. Pierceall
An excellent reference for individuals involved in the design and development of plantings and constructed features for residential sites. Illustrations and actual residential case study examples are used to communicate graphic, planning and design concepts which are the focus of this text. **$53.00**

370 - LANDSCAPE OPERATIONS: MANAGEMENT, METHODS & MATERIALS
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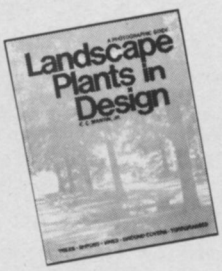

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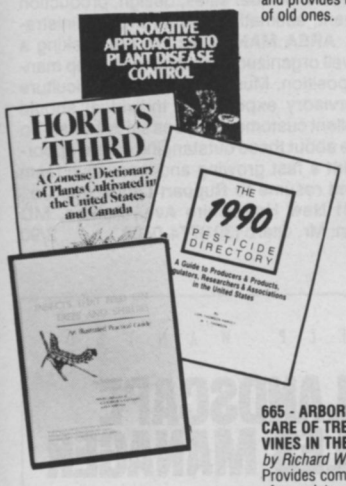
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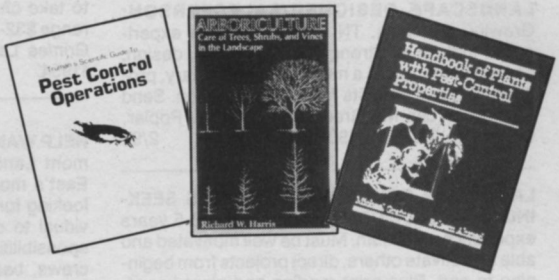
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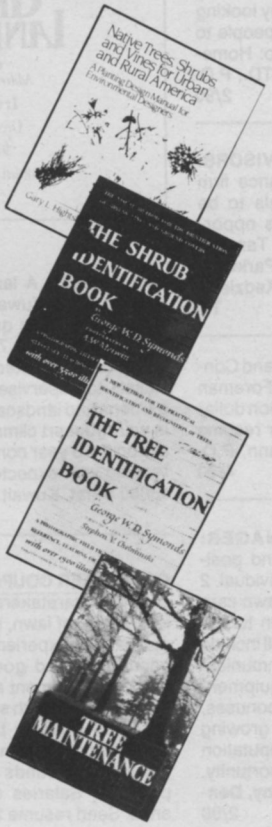
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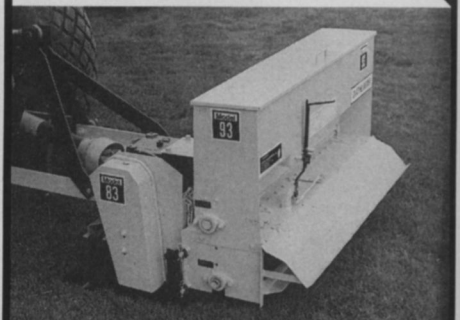

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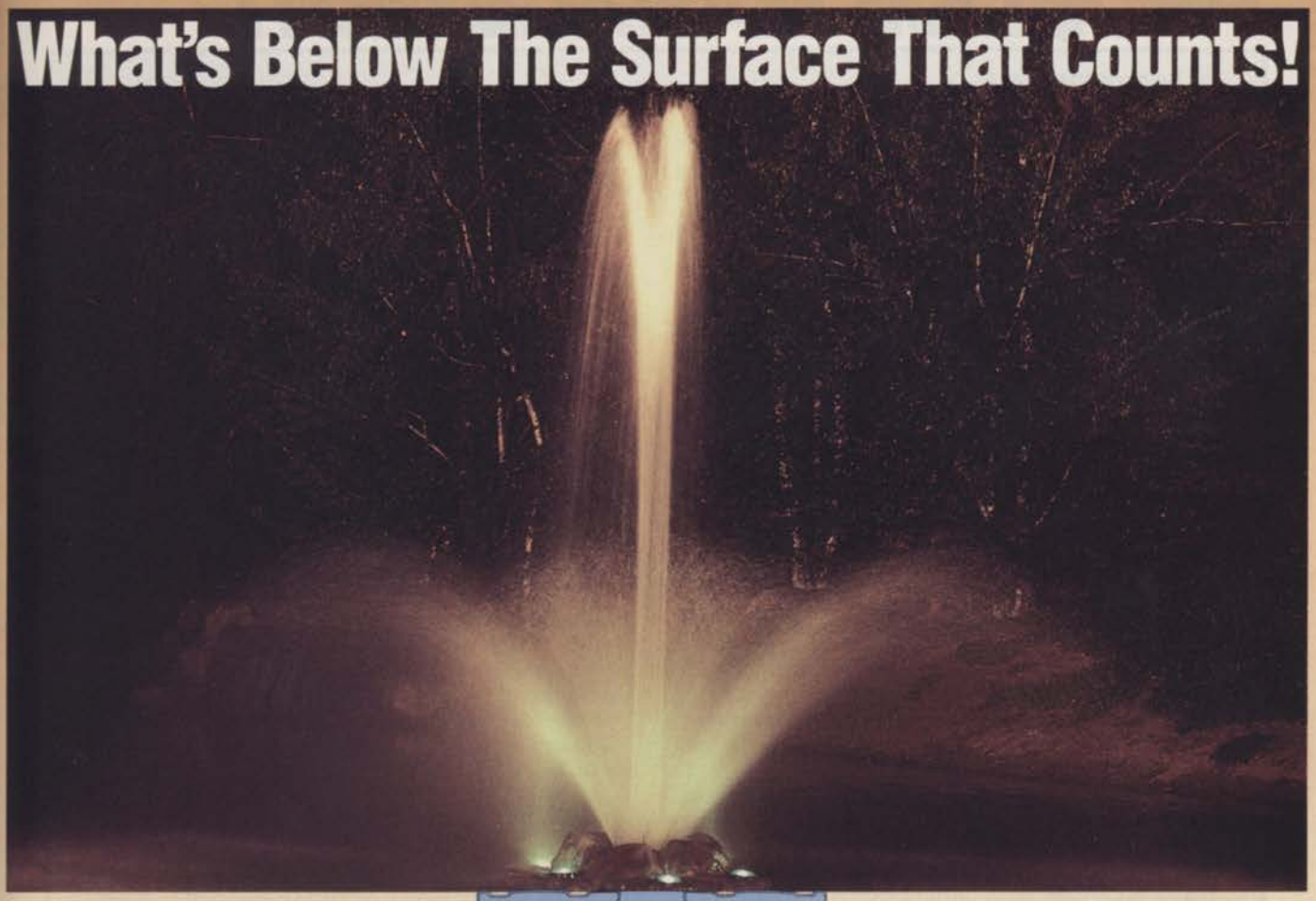

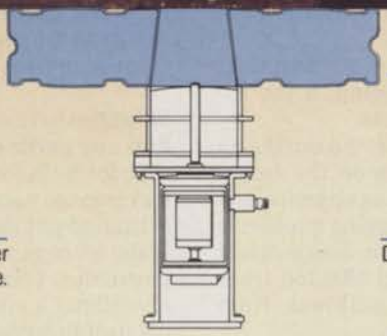

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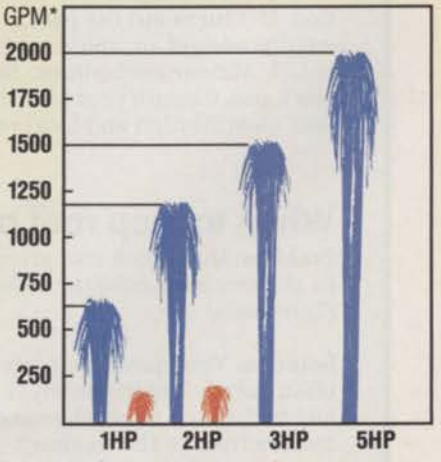

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PROBLEM MANAGEMENT

by **Balakrishna Rao,** Ph.D.

Controlling woolly aphids

Problem: *Can you suggest a method of controlling woolly aphids in fir trees, other than using diazinon or malathion? My success rate has been only fair with these pesticides. Would a systemic give better results? (Canada)*

Solution: The woolly aphids in fir trees to which you are referring are probably balsam woolly adelgids, *Adelges piceae*. This is not a true aphid, but is a member of a family closely related to aphids, *Adelgidae*. It is a serious, destructive sucking insect of true firs (*Abies sp.*) in the United States and Canada. It does not attack Douglas fir, *Pseudotsuga menziesii*, a tree that is not a true fir, and it does minimal damage to Noble fir, *Abies piceae*.

An understanding of the insect biology and damage it causes might be helpful in the management of this pest. The balsam woolly aphid may have two or three generations per year. This adelgid may be found on all parts of the bark from the trunk to the twigs. Reports indicate that the entire population of this insect consists of females. The adults are wingless and purplish to black when the wax is removed. They remain attached to the tree with their long penetrating mouthparts.

The eggs hatch into tiny crawlers that move around. They finally settle down and insert their long sucking mouthparts while wax ribbons are selected from glands along the side and lower back of the crawler after feeding for some time. Later the entire body will be covered with white woolly material.

Affected plants show "gouting of the terminal portions of twigs" due to insect feeding. If the infestation is severe it can kill the plants.

The balsam woolly adelgid is protected during its entire existence under the swellings on the twigs. Therefore, it is difficult to manage using chemicals. It might also explain why you are having problems managing with diazinon or malathion. Since direct control is difficult, remove and burn affected trees during the winter to prevent the outbreak from spreading, if possible.

According to Dr. Douglas Caldwell, our staff entomologist, multiple applications of Sevin might be helpful in managing this pest in a landscape situation. If it turns out the pest is some other species of woolly adelgid or aphid such as the balsam twig aphid, *Mindarussabietinus*, Sevin or Orthene may work also. Consult your Ministry of Environment for pest identification and local recommendations.

When to stop root pruning

Problem: *How much root pruning can a mature tree in the treelawn tolerate before failure or decline? (Tennessee)*

Solution: Your question is interesting and is one I am often asked. Unfortunately, I am not familiar with any formula or research concerning root pruning of mature trees in the treelawn. Of course, the farther away from the trunk the pruning is done, the less stress on the tree.

Several different factors such as tree species, tree vigor and vitality, soil type, extent of root injury and cultural practices before and after root pruning can influence tree tolerance or decline. Trees may show varying degrees of recovery as a result of soil disturbance, root pruning and compaction, which changes the soil environnment around the plants.

Plants weakened by the above factors can be susceptible to insect, disease or other abiotic disorders. In addition, the reduced root structure may subject the trees to wind throw.

In spite of these drawbacks, sometimes root pruning of established trees is unavoidable or becomes necessary because of road or sidewalk installation. In this type of situation, I have observed cases where the trees to be root pruned were fertilized with controlled-release fertilizer containing "low burn" nitrogen well in advance of the operation. The objective was to simulate the development of absorbing roots and improve plant health. These trees appeared healthy without any crown symptoms two years after root pruning and the installation of the road. Therefore, if the job is done with due consideration to the plant's overall health, there might be less stress and perhaps faster recovery can be expected.

Info needed on pH adjusting

Problem: *Do you have a formula for adjusting water pH above 8 to neutral prior to mixing with pesticides? (South Carolina)*

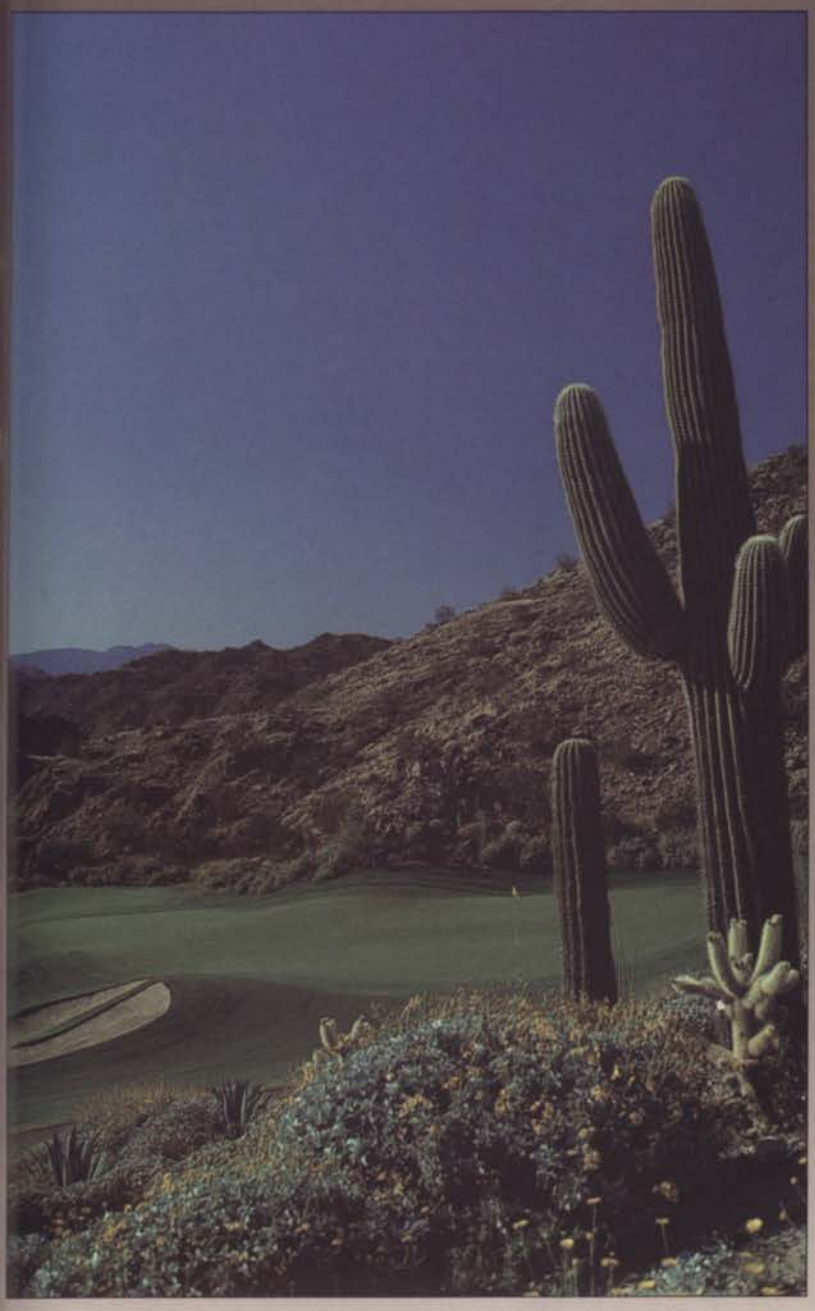
Solution: In reviewing our literature, I was unable to find any pertinent information concerning any specific formula for adjusting water pH above 8 to neutral prior to mixing with pesticides. Although there is limited published data concerning alkaline hydrolysis of organophosphate and half-life of these pesticides, I am not familiar with any publication describing a standard mixing formula to lower the pH unit to a desired level.

It would be very handy and useful in our industry to have this information. I hope some of the manufacturing companies of buffering agents and/or other researchers might supply the answer to your question by contacting me. In the meantime, your best approach would be to contact some buffering agent manufacturers.

A number of commercially available products on the market that might be useful for lowering the pH, including: Buffer-X (Kalo-Lab), Nutrient Buffer Spray (Ortho), Spray-Aide (Miller), Sorba-Spray (Leffingwell), Unite (Hopkins), phosphoric acid (Morral Chemical Co.) and MAP (monoammonium phosphate) (Dysart Co.). **LM**

Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, LANDSCAPE MANAGEMENT, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.



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